QUARTERLY REVIEW of PEDIATRICS

Child Health Services and Pediatric Education

Vol. 4 No. 2 May 1949

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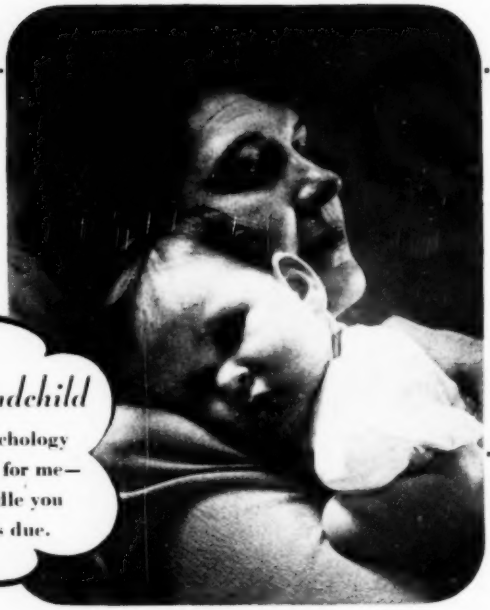

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QUARTERLY REVIEW of PEDIATRICS

Vol. 4 No. 2 May 1949

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Foreword

The prime function of the QUARTERLY REVIEW OF PEDIATRICS is to present, in readable form, summaries of all the important new contributions in every branch of pediatrics. The abstracts are prepared by pediatricians familiar with the subjects under consideration. The Editorial Board checks over all abstracts and adds interpretive or critical comments whenever necessary. The "Bookshelf" department reports informatively on new books the pediatrician should know about. Thus, within the covers of a single journal, there is brought together a concise chronicle of pediatric progress, well organized, reliable and complete. By exploring the entire expanse of medical literature the QUARTERLY REVIEW OF PEDIATRICS keeps its readers abreast of the most recent progress in all of pediatrics. A subscription to THE QUARTERLY REVIEW OF PEDIATRICS represents a continuous seminar on advances in pediatrics.

For convenience of reference the abstracts are grouped as follows:

1. Allergy
2. Anomalies, Genetics
3. Blood, Hemopoietic System
4. Cardiovascular System
5. Chemotherapy, Drugs, Poisons, Physical Agents
6. Clinical Pathology
7. Endocrine System
8. Eye, Ear, Nose and Throat
9. Gastrointestinal System
10. Genitourinary System
11. Growth, Puberty, Adolescence
12. History, Biography, Antiquities
13. Infectious Diseases, Acute
14. Infectious Diseases, Chronic
15. Liver, Kidneys, Spleen
16. Metabolic and Systemic Disorders
17. Milk; Infant and Child Feeding
18. Miscellaneous
19. Musculoskeletal System
20. Nervous System
21. Newborn Period, Prematurity
22. Nutrition
23. Parasitic Diseases
24. Pathology, Anatomy, Bacteriology
25. Physiology, Biochemistry
26. Psychology, Psychiatry
27. Public Health, Epidemiology
28. Respiratory System
29. Skin, Teeth, Hair
30. Social, Economic, and Organizational Problems
31. Surgery, Anesthesia
32. Tumors

The Pediatric Bookshelf

New Books, Pamphlets

Announcements

Issues of the QUARTERLY REVIEW OF PEDIATRICS appear in February, May, August, and November. A cumulative index for each volume is included in the November number. Suggestions, correspondence and editorial communications should be addressed to Irving J. Wolman, M.D., *Editor*, The Children's Hospital, 1740 Bainbridge Street, Philadelphia 46, Pa. Subscriptions should be mailed to the Washington Institute of Medicine, 1708 Mass. Ave., N. W., Washington 6, D. C. Annual Subscription: $11.00. Three years: $28.00.

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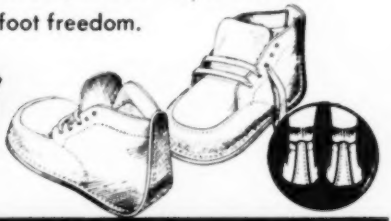

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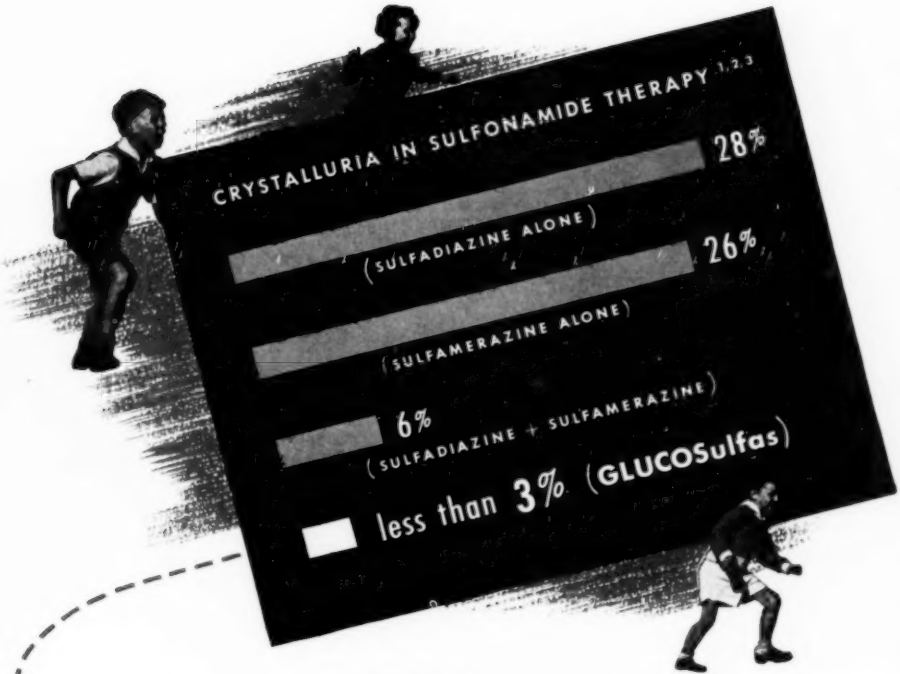

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1. Flippin, H. F., and Reinhold, J. G.: Ann. Int. Med. 25:433, 1946.
2. Ledbetter, J. H., and Cronheim, G. E.: Am. J. Med. Sci. 216:27, 1948.
3. Frisk, A. R., et al: Brit. Med. J. 1:7, 1947.

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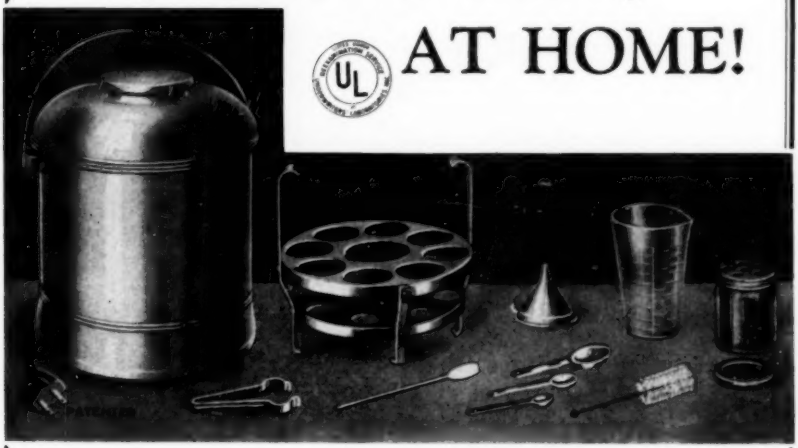

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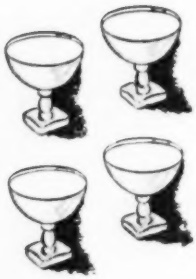
"change for the better!"



Patient acceptance of liquid milk is often difficult, if not impossible, to achieve in the face of intractable aversion to this essential nutrient. In such cases—with the use of "Junket" Rennet Powder or "Junket" Rennet Tablets—milk may be simply and quickly transformed into eye-appealing, taste-tempting rennet-custards . . . with no loss of the nutritional factors so important, particularly in infancy, childhood, pregnancy, and gastro-intestinal and post-operative conditions. Also, rennet-custards are digestively more acceptable because of the smaller, more friable curds produced in the stomach by the enzymatic action of rennin. Your patients (both young and old) will appreciate your recommendation of delicious rennet desserts, and you will thereby make the prognosis for milk and patient alike, a "change for the better!"

Make delicious rennet desserts with either

"Junket" Rennet Powder—six popular flavors, already sweetened

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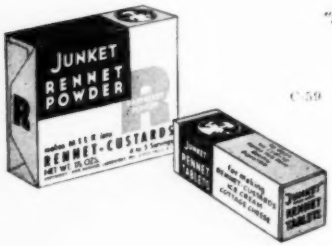

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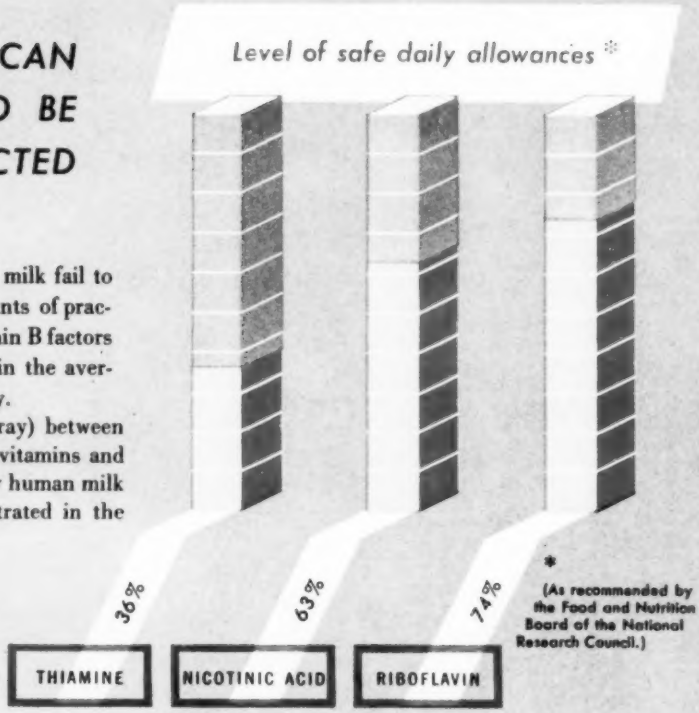
*U. S. P. Minimum Requirements

These are nutritional gaps in human milk

. . . THEY CAN AND SHOULD BE CORRECTED

BOTH human and cow's milk fail to provide sufficient amounts of practically all essential vitamin B factors for optimum nutrition in the average diet of early infancy.

The gap (shown in gray) between optimal levels of these vitamins and the amounts supplied by human milk (shown in red) is illustrated in the chart to the right.



SPECIFICALLY formulated to correct these "nutritional gaps" in the infant's diet, White's Multi-Beta Liquid, in dosage of five drops daily, raises the intake of all clinically important vitamin B factors to optimal levels—supplying these factors *in amounts proportionate to their usual insufficiencies.* Notably stable, non-alcoholic, in "drop-dosage" form. Freely soluble in milk mixtures and orange juice. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

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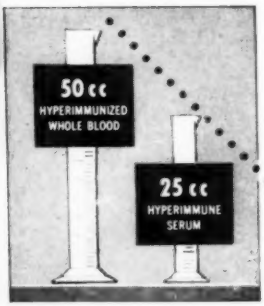

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May 1949

Vol. 4 CONTENTS No. 2

Child Health Services and Pediatric Education

Report of the Committee for the Study of Child Health Services of the American Academy of Pediatrics ... 95
The Road Ahead for Better Child Health ... 99
Graduate Education for Pediatric Practice ... 103

1. Allergy

Food Sensitivity in 100 Asthmatic Children ... 104
Anthallan Therapy in Infantile Eczema ... 104

2. Anomalies, Genetics

Gaucher's Disease ... 105
Death, Defect, and Disability in Prenatal Life. An Epidemiologic Consideration ... 105
Maternal Measles, Mumps and Chickenpox as a Cause of Congenital Anomalies ... 106

3. Blood, Hemopoietic System

Nutritional Status of Children. VII. Hemoglobin ... 107
The Neutralization of Heparin by Protamine ... 107
Abnormal Hemorrhage with Normal Platelet Count and Normal Clotting ... 107
Two Different Types of Anemia in Twins Fed with Goat's Milk ... 108
Anomalies of Intestinal Absorption of Fat. II. The Haematology of Steatorrhea ... 108
The Span of Life of the Red Blood Cell. A Résumé ... 109
Maternal Isoimmunization Without Evidence of Clinical Erythroblastosis Fetalis in the Newborn ... 109
Erythroblastosis Fetalis in Negroid Infants ... 110
Chronic Lymphoid Leucemia in Children ... 110

Bone and Joint Pain in Leukemia, Simulating Acute Rheumatic Fever and Subacute Bacterial Endocarditis ... 110
The Skeletal Lesions in Leukemia ... 111
Leukemia in Childhood. Preliminary Report of Response to Aminopterin ... 112

4. Cardiovascular System

Treatment of an Infant with Paroxysmal Auricular Tachycardia ... 113
Aortic Pulmonary Anastomosis in Congenital Pulmonary Stenosis. Report of Forty-Five Cases ... 114
Oxygenation Studies in Congenital Pulmonary Stenosis ... 115
Physiological Studies in Congenital Heart Disease. V. The Circulation in Patients with Isolated Septal Defects ... 115

5. Chemotherapy, Drugs, Poisons, Physical Agents

Aureomycin in the Treatment of Primary Atypical Pneumonia ... 116
Aureomycin Therapy in Human Brucellosis Due To Brucella Melitensis ... 116
Subcutaneous Administration of a Sulfadiazine-Sulfamerazine Combination in Children ... 116
The Evaluation of an Effective Dosage of Caronamide (4-Carboxyphenylmethanesulfonanilide) for the Suppression of Tubular Excretion of Penicillin in Children ... 117
Well-Water Methemoglobinemia in Infants. Its Occurrence in Rural Manitoba and Ontario ... 119
The Toxic Manifestations of Sodium Salicylate Therapy ... 119
Propylthiouracil (6-propyl-2-thiouracil) ... 120

6. Clinical Pathology

Hyperglycemia During Streptomycin Therapy ... 121
A Comparison of the Results Obtained with Pernasal and Postnasal Swabs in the Diagnosis of Pertussis ... 121

7. Endocrine System

Thyrotoxicosis in Children ... 122
Congenital Diabetes Insipidus Resistant to Treatment with Pitressin ... 123

8. Eye, Ear, Nose and Throat

What Causes Blindness in Children? (A Report for the Committee on Statistics of the Blind) ... 124
Dacryocystitis of Infancy ... 125
Congenital Impatency of the Nasolacrimal Duct ... 125

9. Gastrointestinal System

Congenital Megacolon. Results of Treatment by Spinal Anaesthesia ... 127

10. Genitourinary System

Hemolytic Streptococcal Vaginitis in Children ... 127

11. Growth, Puberty, Adolescence

Creatinine Excretion, Growth Progress and Body Structure in Normal Children ... 128
Individual Differences in Physical Changes Associated with Adolescence in Girls ... 129

12. History, Biography, Antiquities

See Contents for Related Articles

13. Infectious Diseases, Acute

Penicillin in the Treatment of Diphtheria and the Diphtheria Carrier State 130
How Long Does Immunity to Diphtheria Last? 130
Treatment of Infantile Diarrhea with Streptomycin and an Oral Amigen Mixture 130
Studies of the Acute Diarrheal Diseases. XIX. Immunization in Shigellosis 131
Postvaccinal Encephalitis. A Report of 45 Cases in New York City 132
Vaccination Against Influenza A and B. A Comparison of Reactions, Doses and Titer Responses of Two Different Vaccines in Infants and Children 132
Infectious Croup 133
Mumps Meningoencephalitis in Children 135
The Immunizing Efficiency of Diphtheria Toxoid when Combined with Various Antigens 135
Antibody Formation in Early Infancy Against Diphtheria and Tetanus Toxoids 135
Diphtheria Immunization with an Alum-Precipitated Mixture of Pertussis Vaccine and Diphtheria Toxoid 137
Pertussis Immunization with Two Doses of an Alum-Precipitated Mixture of Diphtheria Toxoid and Pertussis Vaccine 138
The Use of Combined Antigens in the Immunization of Infants 139
The Treatment of Tetanus. Report of Two Cases with Critical Comment on New Therapeutic Resources 140
An Unidentified, Filtrable Agent Isolated from the Feces of Children with Paralysis 140
Tetanus Neonatorum 141
Rocky Mountain Spotted Fever Vaccine 141
Management of Tick Typhus (Rocky Mountain Spotted Fever) in Children 142
Para-Amino Benzoic Acid in the Treatment of Rocky Mountain Spotted Fever. A Report of Its Use in 17 Cases 143
The Treatment of Rocky Mountain Spotted Fever with Chloromycetin 144
A Familial Spread of Vaccinia with One Death. Isolation and Identification of the Virus 144
The Relationship of Varicella and Herpes Zoster. Electron Microscope Studies 145
The Use of Rabbit Serum in the Treatment and Prophylaxis of Whooping Cough 145

14. Infectious Diseases, Chronic

The Epidemiology of Rheumatic Fever. Its Public Health Aspects 146
Some Factors Predisposing to Juvenile Rheumatic Fever in Sydney 146
Prevention and Treatment of Prenatal Syphilis 147
Penicillin Treatment of Early Congenital Syphilis 148
Childhood Tuberculosis in Rome During the War Years 148
The Efficacy of BCG Vaccination 149
The Clinical Administration of Dihydrostreptomycin in Tuberculosis. A Preliminary Report 149
Streptomycin in Abdominal Tuberculosis in Children 150
Treatment of Tuberculosis with Streptomycin. Sulfone and Vitamin A. Miliary Tuberculosis and Tuberculous Meningitis 150
Observations Concerning Local Treatment of Tuberculous Pleurisy with Streptomycin 152
Streptomycin Treatment of Tuberculous Meningitis 152

15. Liver, Kidneys, Spleen

Lipoid Nephrosis. Clinical and Biochemical Studies of 40 Children with 10 Necropsies 153
Endogenous Creatinine Clearance in Infancy and Early Childhood 155

16. Metabolic and Systemic Disorders

Treatment of Diabetic Coma 155
Myasthenia Gravis in Young Children. Report of Three Cases. One Congenital 157
Case Report. Progressive Lipodystrophy. Etiologic Aspects and Report of a Case 158

17. Milk; Infant and Child Feeding

The Biological Value of a Meat Hydrolysate in the Infant 159
Infant Nutrition in Rome During and After the War 159
Semi-Self-Demand Feeding Schedule for Prematurely Born Infants 160

18. Miscellaneous

See Contents for Related Articles

19. Musculoskeletal System

The Roentgen Diagnosis of Rickets Associated with Other Skeletal Diseases of Infants and Children 161

20. Nervous System

Encephalopathies Following Prophylactic Pertussis Vaccine 162
The Use of Benzedrine and Dexedrine Sulfate in the Treatment of Epilepsy 163
The Electroencephalographic Findings in Measles Encephalitis 163
Subdural Hematoma in Infancy 164

21. Newborn Period, Prematurity

Infant Mortality in Rome from 1936 to 1944 165
Control of Air-Borne Infections in a Nursery for Young Infants 166
A Study of Neonatal Infections in the Nurseries of a Maternity Hospital 167
The Baby as a Problem in Premature Delivery 167

22. Nutrition

Plasma Levels of Vitamin C Among School Children in Paris, 1947 168
Nutritional Status of Children.
III. Blood Serum Vitamin C 168
IV. Nutritional Conditioning in a Health Camp 169
V. Blood Serum Protein 171
VI. Blood Serum and Vitamin A and Carotenoids 171

23. Parasitic Diseases

Diagnosis and Treatment of Scabies 172

24. Pathology, Anatomy, Bacteriology

See Contents for Related Articles

25. Physiology, Biochemistry

The Effect of Oral Administration of Casein Hydrolysate on the Total Circulatory Plasma Proteins of Man 173
The Chemical Specificity of the Interaction of Diverse Human Plasma Proteins 173
The Permeability of the Human Placenta to Sodium in Normal and Abnormal Pregnancies and the Supply of Sodium to the Human Fetus as Determined with Radioactive Sodium 174
Blood and Extracellular Fluid Studies in Chronic Malnutrition in Infancy 174
Convalescence. A Study in the Physiological Recovery of Nitrogen and Liver Function 175

26. Psychology, Psychiatry

Encephalitis as a Causative Factor in Behavior Disorders of Children. An Analysis of Seventy-Eight Cases 176
A Biochemical Consideration of Mental Deficiency. The Role of Glutamic Acid 178

27. Public Health, Epidemiology

Deaths by Age. United States, 1947 180
Infant Mortality and Its Causes in China 180
Swimming Pools. Their Relation to Illness 181

28. Respiratory System

Receding Chin and Glossoptosis 181
Nontuberculous Pulmonary Calcification 182
The Significance of Triangular Hilar Shadows in Roentgenograms of Infants and Children 183

29. Skin, Teeth, Hair

The Local Treatment of Tinea Capitis Due To M. Audouini. The Importance of Inflammatory Reaction as an Index to Curability 183

30. Social, Economic, and Organizational Problems

See Special Introductory Section

31. Surgery, Anesthesia

Antethoracal Transplantation of the Stomach in the Treatment of Congenital Atresia of the Thoracic Esophagus 185
Acute Intussusception in Childhood 185
Congenital Chondrosternal Depression (Funnel Chest) Relieved by Chondrosternoplasty 186

32. Tumors

Familial Polyposis and Carcinoma of the Colon 187
Large Solitary Pancreatic Cyst and Other Developmental Errors in a Premature Infant 188
Two Cases of Cystic Lymphangioma of the Neck with Mediastinal Involvement 188
Childhood Cancer and Leukemia in the United States. (Editorial) 188

The Pediatric Bookshelf

Pediatria Internazionale 191
Congenital Malformations of the Heart 191
Premature Infants. A Manual for Physicians 192
The Child in Health and Disease 192
Psychopathology and Education of the Brain-Injured Child 193
The Psycho-Analytical Approach to Juvenile Delinquency. Theory, Case-Studies, Treatment 194
Handbook of Pediatric Medical Emergencies 194
Studies in Child Development 195
An Introduction to Bacteriological Chemistry 195
The ABC of Acid-Base Chemistry 195
Chemical Anatomy, Physiology and Pathology of Extracellular Fluid. A Lecture Syllabus 196
Practical Methods in Biochemistry 196
The Foot and Ankle. Their Injuries, Diseases, Deformities and Disabilities 196
Modern Medicine Annual—1948 196

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* Campbell, P. A.: Diagnosis and Treatment of External Otitis, Illinois M. J., 93:98-102 (Feb.) 1948.

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QUARTERLY REVIEW

of

PEDIATRICS

Volume 4 Number 2

May 1949

Special Review

CHILD HEALTH SERVICES AND PEDIATRIC EDUCATION. Report of the Committee for the Study of Child Health Services of the American Academy of Pediatrics, with the cooperation of the United States Public Health Service and the United States Children's Bureau. The Commonwealth Fund, New York, 22, N. Y. Volume I. $3.50.

The full report of the nation-wide survey of child health services and pediatric education in this country has just been published. This comprehensive inventory and analysis was sponsored by the American Academy of Pediatrics, and is the first such study to be carried out by any medical specialty or for any age group. It represents an analysis of the pediatric activities of physicians and dentists in private practice, the available services and facilities of hospitals and community health agencies (both official and voluntary), and the present status of pediatric education in medical schools and hospitals approved for pediatric residency. The information gained by the survey will play an important part in the planning for the future development of child care and pediatric education in the United States, as is brought out in the booklet "The Road Ahead For Better Child Health" (see next abstract).

The individual practitioner will find in the tabulations much pertinent information which will help him visualize his own place in the scheme of pediatric practice in America. How this report will be used if federalized medicine is established in the United States remains to be seen but it will undoubtedly be of great importance.

Total Volume of Child Health Services:—If the upper limit of childhood is taken as 15 years of age there are approximately 36 million children in the United States (as of July 1, 1945). In terms of concentration per unit area the number of children ranges from 158 per square mile in Rhode Island to 0.3 in Nevada. Twenty-three per cent live in greater metropolitan counties, 24 per cent in lesser metropolitan counties, 16 per cent in counties adjacent to metropolitan areas,

27 per cent in isolated semi-rural counties and 10 per cent in isolated rural counties. One outstanding feature of the survey is the overall picture of the extent of medical and dental care being given to all the children of the United States on one representative day. On an average day, 13.8 out of every 1,000 children come under medical supervision. Of these, 8.3 are seen by general practitioners, 1.2 by pediatricians and 1.2 by other specialists, at home or in the office; 0.4 visit clinics; and 2.7 are under care in hospitals. Children in the metropolitan areas and adjacent counties receive disproportionately more of this medical care than do children in isolated counties. In fact, the children away from medical centers receive only one-fifth to one-half as much of the highly skilled diagnostic and treatment services. The average number of children under medical care per 1,000 per day varies from 17 in the northeast and central states to 10 in the southwest and in the southeast regions of the United States. One-fourth of all the children live in the southeast regions where there is this low rate of medical care. Differences in amount of care are believed to be reflected in the infant mortality rates. The infant mortality rate for metropolitan and adjacent areas in 1941 to 1945 was 38 deaths per 1,000 live births; for isolated counties, 47. Total volume of medical care and the economic level of the individual states are closely correlated. Children in a state with a high income per capita such as New York receive more than twice as much care as those in a low income state such as Alabama. Three children in every 1,000 receive dental care on an average day, with 96 per cent of these receiving attention from private dentists. There was striking variation by country group, state and region. In the northeast and central regions 5 children out of 1,000 are given dental care on one day, whereas in the southwest there was only 1 child per 1,000.

Distribution of Physicians and Pediatricians:—The survey shows approximately 116,800 physicians were in private practice during 1946. Of these, 75,000 are general practitioners, 3,500 are listed as pediatricians, and the remainder are specialists in other fields. Pediatricians are defined as physicians who by their own statement limit their practice to this specialty. There are 3.2 practicing physicians per 1,000 children (or 308 children per physician), of whom 0.1 are pediatricians, 2.1, general practitioners and 1.0, other specialists. The relative numbers of all three groups of physicians are higher in the metropolitan areas and adjacent communities than in the isolated semi-rural and rural counties. The number of children per physician ranges from 143 in New York to over 700 in the five southern states at the bottom of the list. Approximately one-third of all the pediatricians in the country (1,116) live in New York, Pennsylvania and Massachusetts. Seventy-five per cent of the pediatricians in private practice are in cities of 50,000 or more population. Only 309 of the 3,500 pediatricians are in isolated semi-rural counties and only 4 in isolated rural counties. There are 2,600 counties, 5 out of every 6 in the country, that had no specialists in pediatrics. About half of the pediatricians in private practice

are in cities having medical schools. The percentage of pediatricians is greatest in the states with the highest incomes. Half of the pediatricians are less than 44 years of age, in comparison with general practitioners whose median age is 48 years of age. About 13 per cent of the pediatricians (460) are women.

Physicians' Services:—The average number of patients seen per day by general practitioners is 16, of whom 5 are children. In other words, almost one-third of general practice was concerned with the field of pediatrics. The average case load of pediatricians proves also to be 16 patients per day. Fifty-four per cent of the pediatricians' visits are for health supervision and 43 per cent for sick child care, the remaining 3 per cent being for persons age 15 or older. In contrast, only 1 in 3 of the general practitioners' child visits are for health supervision. There are relatively more visits for health supervision in the states with the most physicians and in the metropolitan counties as compared with the isolated rural counties. As for hospital training as intern or resident, 27 per cent of the physicians listed as pediatricians have had less than 1 year of internship on a pediatric service, including some that had no pediatric internship at all. Only about half had had more than two years of hospital training in pediatrics. In contrast, about 1 out of 5 of the general practitioners had had less than a year of intern experience; only half had as much as a month of pediatric training in a hospital internship. In terms of patient's age, 15 per cent of the pediatricians' practice is being given to infants under 1 month of age, 33 per cent to infants between 1 month and 1 year, 33 per cent to children 1 through 5 years, 16 per cent to children 6 through 14 years and 3 per cent to those 15 years and over.

Hospitals:—The number of beds in general hospitals that admit children range from 18 per 1,000 children in the Pacific region to a rate of 8 in the Southeast. The greatest shortage is in the southern states. On the basis of hospital births and admissions, more than half of the total amount of hospital care for children is for the newborn. Thirty-six pediatric hospitals were found in the United States in 1946. Many of these are small, often not connected with teaching institutions. Only 14 have more than 100 beds. Eleven are not approved for pediatric residencies.

Community Health Services:—Extensive information has been procured regarding the services rendered by official and voluntary health agencies. The types discussed are: well-child clinics and conferences, mental hygiene services, services for the physically handicapped, public health nursing service, school health services, communicable disease control and dental services. The data on visits per 1,000 children have been used to rate the states on each of five types of service.

Economic Correlations:—"No one fact stands out so sharply as the association of child health services and economic well being". The group of states with the largest per capita income have the lowest

infant mortality, greatest total volume of medical care, most doctors in private practice and most hospital facilities and community health services.

Pediatric Education:—Of the 70 four-year medical schools in this country, about half are situated in the large cities of the northeast and central states. The distribution parallels the density of population. In 66 of the schools, pediatrics was an independent department; in the other 4 it was still a subdepartment of internal medicine. About half of the pediatric department budgets were less than $25,000; in one-fourth, less than $8,000. Most pediatric teaching departments were handicapped by budgets inadequate for the provision of good teaching. Great variation was found in the amount of time devoted to pediatric training in the various medical schools, ranging from 478 to 141 catalogue hours. In half of the schools, over 300 actual hours were spent in pediatrics. The teaching programs were much better in those departments which included full-time members on their staff. A conspicuous contrast between the high ranking pediatric departments and those of low rank is that the former all have full-time department heads and the latter group has no full-time chiefs. However, a number of departments appear to be functioning well with a part-time chief and a full-time subordinate who handles the administrative duties. Interestingly, the heads of departments on full-time spend 60 per cent of their time in administrative duties. Pediatric staff members who give less than one-quarter of their time comprise more than one-half of the entire teaching staffs and account for almost one-third of the aggregate teaching hours. Nearly all these physicians are in private practice, and almost always serve without recompense. Great differences were found among the medical schools as to the number of hours allotted to pediatrics and the division of hours between didactic and clinical methods of teaching. Active student participation in conferences and similar exercises is relatively undeveloped in many schools. The same holds to a lesser degree in a number of hospitals approved for residency training. In some schools training in the care of the newborn is the weakest feature in the pediatric course. Twenty hospitals are approved for pediatric residency training which provide no experience in the care of the newborn. Of the hospitals approved for pediatric residency, almost half do not afford adequate inpatient experience in contagious diseases. Although service in the outpatient department resembles private practice more closely than any other phase of hospital work, many hospitals fail to provide adequate training in this regard for their residents. Only 2 out of 5 medical school graduates now receive pediatric intern training in hospitals approved for pediatric resident training. Two-thirds of these serve for six weeks or less. Many hospitals fail to provide adequate training in the care of newborn and premature infants and in contagious diseases. Not enough outpatient experience is given to men in general internships and to the students in the medical schools.

Conclusions:—Several outstanding facts stand out from the study as the conclusions of the group who made the study: (1) There is a need for more physicians who are well trained in the care of children. "This need can be met only by strengthening pediatric education in medical schools and hospitals, for undergraduates and graduates, for general practitioners and specialists." (2) The same high quality of medical care which now exists in the medical centers must be made available in the remote and rural areas far removed from such centers. Decentralization and regional planning are obvious steps in that direction.

STATE COMMITTEE REPORTS OF THE AMERICAN ACADEMY OF PEDIATRICS WHICH HAVE BEEN PUBLISHED THUS FAR (OTHERS WILL FOLLOW)

Child Health Services in North Carolina. *Arthur H. London, Jr., M.D., State Chairman,* 1105 *West Main St., Durham, N. C.* North Carolina M. J. Suppl. 29 pp. April 1948.

Child Health Services in Mississippi. *Harvey F. Garrison, M.D., State Chairman,* 529 *North State St., Jackson, Miss.* 29 pp. June 1948.

Child Health Services in Missouri. *Bark J. White, M.D.,* 337 *North Euclid Ave., St. Louis and Hugh L. Dwyer, M.D.,* 315 Alameda Rd., Kansas City. Reprinted from: J. Missouri State M. A. Copyright 1949 by Missouri State Medical Association. 20 pp.

Child Health Services in New York State. *George M. Wheatley, M.D., Director of New York Study for the American Academy of Pediatrics,* 1 *Madison Ave., New York, N. Y.* Published by New York State Study Committee, American Academy of Pediatrics, February 1949, 94 pp.

Child Health Services in Florida. *George L. Cook, M.D., State Chairman,* 442 *W. Lafayette St., Tampa, Fla.* Report of the Florida State Pediatric Association. Study of Child Health Services made with the cooperation of the Florida State Board of Health. Published by the Florida State Board of Health. 31 pp.

Study of Child Health Services in South Dakota. *Goldie E. Zimmerman, M.D., State Chairman,* 100 *North Phillips Ave., Sioux Falls, S. D.* 49 pp. June 1948.

Child Health Services in Oregon. *Carl G. Ashley, M.D., State Chairman,* 2455 *N. W. Marshall St., Portland, Ore.* Published under the auspices of the Oregon State Board of Health 80 pp. June 1948.

Louisiana Study of Child Health Services. *Clarence H. Webb, M.D., State Chairman,* 1560 *Line Ave., Shreveport, La.* Published in three installments: New Orleans M. & S. J. (Oct.-Nov.-Dec. 1948).

The Road Ahead for Better Child Health. *Committee for the Improvement of Child Health, American Academy of Pediatrics, December* 1948.

The Problem:—The problem is that of further improving child health in this country by making the full benefits of modern medical care available to all children. Even though American children are

among the world's healthiest, 3 infants died for every 2 soldiers killed in action during World War II. Rheumatic fever kills more school age children than any other disease, being second only to accidents as the leading cause of death in this age group. Nearly 40,000 prematurely born infants die each year. Over 100,000 infants still enter life each year with no medical attention of any kind and in some states only half the infants are born in hospitals. In some counties where modern medical services are scarce, five times as many infants die as in more favored communities. A child's chance of survival depend largely upon where he lives and the circumstances of his parents. Modern medical care is effective only to the degree in which it is applied.

The Needs:—The emphatic needs for improved child care in the United states consist of (1) better training for all doctors who provide child care; (2) adequate distribution of services and facilities. Three-fourths of the private care of children of the nation is in the hands of the general practitioners, but nearly one-half have had virtually no hospital training in child care; and one-fourth of the pediatricians have had little hospital training in the medical care and health supervision of children. Pediatricians are increasing rapidly in number but their services are principally limited to children in and near metropolitan areas. Three-quarters of the nation's practicing pediatricians are in cities of 50,000 or more population; one-half in communities having medical schools. One-third are in Massachusetts, New York and Pennsylvania. (Figure 1). The general practitioner who is principally responsible for protecting the health of children actually has little time for preventive measures, since only 9 per cent of his time is given

FIGURES SHOW NUMBER OF PEDIATRICIANS IN EACH STATE

Figure 1

for well child care (Figure 2). Complete medical care is not available to all children. There are 36,000,000 children under 15 years of age in the United States. Thirteen million children, one-third of the total, live in isolated counties. Children in or near cities receive 50 per cent more care than those in isolated counties. Children in some areas receive only a fraction of medical care rendered to children in other areas. They are handicapped particularly in specialist care, clinic care and the highly skilled diagnostic and treatment services. Over one-third of American children are cared for in hospitals which are inadequately staffed and equipped. Children in outlying areas do not have full benefits of preventive medicine or of dental care.

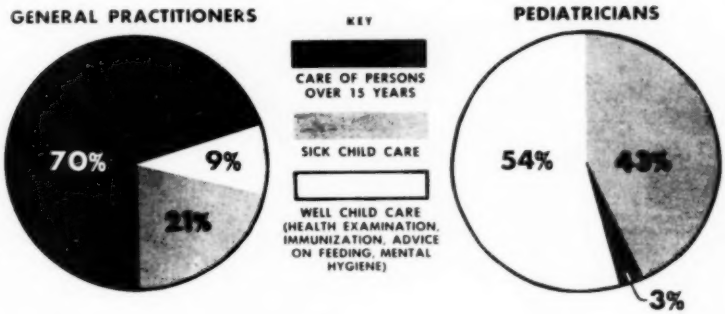


Figure 2

Method of Fulfilling the Needs:—The road to better medical care for children begins at the medical school and extends, through affiliation of the schools with outlying hospitals, into the remotest communities. It must be made possible for all physicians—general practitioners as well as specialists—to acquire more hospital experience in child care through the strengthening of both their undergraduate and graduate pediatric training. A few medical schools provide as much as three hundred hours of clinical teaching in pediatrics for undergraduates but the average is only one hundred and sixty-one hours. Clinical teaching and research staffs must be strengthened. Financial aid in the form of fellowships is also required if students after graduation are to round out their training as hospital interns and residents. Part of this training should include work for short periods in outlying hospitals affiliated with medical schools. The doctor will accordingly embark on practice soundly trained and already seasoned in child care. Hospitals in outlying communities should plan to accept graduate students for resident training and to affiliate in close touch with metropolitan services. With encouragement, many outlying hospitals can become affiliated with medical schools in metropolitan centers. Weekly visits of specialists

from the medical center and from regional hospitals serving as halfway stations bring special services of pediatricians, pathologists, etc. that these hospitals cannot afford to maintain alone. In other words, affiliation with a medical center brings modern medical care to isolated communities.

Obstacles:—One great obstacle to this projected training program is that medical schools, financially hard pressed, find it difficult to maintain even present standards. Pediatric departments especially are underfinanced. Half of the pediatric department budgets are less than $25,000 each; one-fourth are less than $8,000. For every dollar that private charities annually spend on child health and welfare programs, only 3 cents is spent on the training of doctors in child care.

First Steps:—As first steps, the Committee recommends: (1) Strengthening of basic teaching budgets of medical school pediatric departments toward better preparation of medical students in the care of sick children and in the health supervision of well children. (2) Extension of medical teaching and services to outlying areas (Figure 3). (3) Provision of fellowships for graduates who cannot otherwise afford to acquire thorough hospital training in pediatrics prior to entering practice. (4) Coordination of decentralized medical education and services with action programs within the states, as well as with such projects as the Hospital Survey and Construction Program.

End Result:—Inherent in all medical schools is a unique potential for rendering medical services over and above the actual training of physicians. The very nature of medical training provides medical servi-

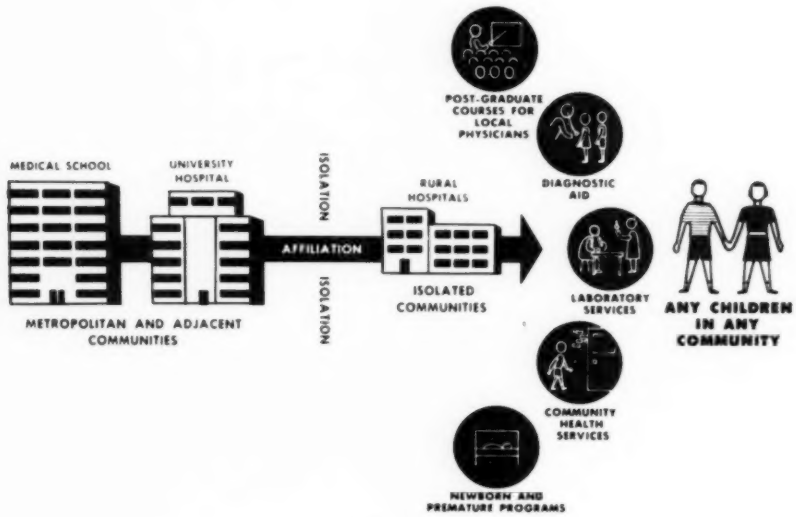


Figure 3

ces of high caliber to people in the neighboring communities. The principle of decentralized training is to bring medical teaching to remote communities—to establish a circle of secondary teaching centers around a university medical school. Decentralized training not only produces better trained physicians but closes the gap or lag between the discovery of new technics and the application of these technics to children in the most remote areas. Finally, the training of graduate medical students themselves is broadened by their experience in rural hospitals and such experience induces them to remain in rural communities to practice.

Membership of the Committee for the Improvement of Child Health of the American Academy of Pediatrics: James L. Wilson, M.D., Ann Arbor, Mich., Chairman; Lee Forrest Hill, M.D., Des Moines, Ia.; Roger L. J. Kennedy, M.D., Rochester, Minn; Henry G. Poncher, M.D., Chicago, Ill.; Grover F. Powers, M.D., New Haven, Conn.; Warren W. Quillian, M.D., Miami, Fla.; Hulda E. Thelander, M.D., San Francisco, Calif.; Clarence H. Webb, M.D., Shreveport, La.; George M. Wheatley, M.D., New York, N. Y.; also the President, President Elect and Secretary of the Academy, *Ex Officio*, John P. Hubbard, M.D. is the executive Director with offices at the Children's Hospital of Philadelphia, 1740 Bainbridge St., Philadelphia 46, Pa. Comment and suggestions on these objectives will be welcomed. The state chairmen of the American Academy of Pediatrics are responsible for the development of planning within their respective states.

"How to make good medical care available to all infants and children, no matter where they live or what their circumstances, is the number one health problem of this country."

Graduate Education for Pediatric Practice. *John Mc K. Mitchell, University of Pennsylvania School of Medicine, Philadelphia, Pa.* Paper read before the Annual Meeting of the American Academy of Pediatrics, Atlantic City, N. J. Nov. 22, 1948.

In 1947 the Study of Child Health Services of the American Academy of Pediatrics conducted a survey of hospitals approved for residency training in pediatrics. This paper represents an appraisal of the training provided in these hospitals in terms of how satisfactorily it fits physicians for the practice of pediatrics. The survey suggests that general training in the diagnosis and medical care of the sick infant and child is well handled but that in certain specific categories there are serious gaps. About 30 per cent of the hospitals provide less than one admission per resident every two and a half days. This is held to represent an insufficient case load. The necessity of adequate experience in the care of newborn and premature infants, especially in view of the difficulty in providing training at the undergraduate level, is pointed out. Nevertheless, 12.5 per cent of approved hospitals fail to provide any training in care of the newborn to that 11 per cent of residents which they train.

Almost half of the hospitals lack what are considered to be adequate facilities for training in the field of contagious diseases. These hospitals train one-third of pediatric residents. Suggestions are made for improvement of this situation. Eight per cent of the hospitals fail to provide, or offer grossly inadequate experience in outpatient service. The seriousness of this deficiency is pointed out. A plan is offered for the removal of deficiencies through a program of affiliation between hospitals.

1. Allergy

Food Sensitivity in 100 Asthmatic Children. *Lewis Webb Hill, Children's Hospital and Harvard Medical School, Boston, Mass.* New England J. Med. 238:657-59, May 6, 1948.

Food sensitivity plays a definite, although small role in childhood asthma. One hundred children from 3 to 12 years of age were tested by the scratch method; 35 reacted positively to one or more foods. In the 65 negative reactors, the asthma could be attributed to sensitization from environmental allergens or recurrent respiratory infections. There were 218 positive scratch tests: in 44 (20 per cent) the food in question could produce an asthmatic attack, and of these, 38 were accounted for by egg white, fish, peanut, walnut and chocolate. In 16 (8 per cent), the food caused mouth irritation, vomiting, urticaria and angioneurotic edema but not asthma; in 158 (72 per cent), the positive reacting foods produced no symptoms. 5 references. 1 table.—*B. J. Shuman.*

Anthallan Therapy in Infantile Eczema. *Martain S. Kleckner, Jr. (Capt., M.C. A.U.S.), Allentown, Pa.* Am. Pract. 11:639-42, June 1948.

Nine infants with eczema are described who were treated with relatively large doses of the antihistaminic drug Anthallan for a period never shorter than four weeks. With all, the therapeutic result was stated to be satisfactory and persistent. Anthallan was found devoid of toxic side effects. Most of the cases had failed to improve while under various other therapeutic regimens. 4 references.

(*In the light of the wide experience with other antihistaminics which have proved of very limited usefulness in infantile eczema, one would like to draw conclusions from a larger series than here given.* —ED.)

2. Anomalies, Genetics

Gaucher's Disease. *Huei-Lan Chung, Kuang-Yu Ch'in, Sung-Tao Kwan, Hsiu-Chih Weng and Ch'ing-Tseng Teng, National Peking University Medical College Hospital, Peking, China.* Chinese M.J. 66:119-24, March 1948.

Gaucher's disease is reported for the first time in China. A boy of 15 years had a large splenic tumor of ten years standing, with severe anemia, leukopenia, thrombocytopenia, bleeding tendencies and hepatomegaly. The family history of the patient revealed 2 other possible cases; 1 elder brother having a similar mass died at 12; a younger sister, 12 years old, with a mass in her abdomen was still living. The patient was underdeveloped and undernourished but alert and cooperative. Pingueculae were found in the bulbar conjunctivae. After excluding chronic malaria, kala-azar, splenic anemia and leukemia, many typical Gaucher's cells were found in the smears from diagnostic punctures of the spleen, liver and sternum. The bone marrow showed an active normoblastic picture and marked reduction in megakaryocytes, with a myeloid-erythroid ratio of 1:1. In this case the results of splenectomy support the concept that the anemia, leukopenia, thrombocytopenia and bleeding tendency in Gaucher's disease are due to hypersplenism. Two weeks after the operation the blood picture was practically normal, and the patient has remained well since. "Further observation will decide whether or not the beneficial effect of splenectomy is permanent." 5 references. 4 figures.—*C. L. Kao.*

Death Defect, and Disability in Prenatal Life. An Epidemiologic Consideration. *J. E. Gordon and T. H. Ingalls, Boston, Mass.* Am. J. Pub. Health 38:66-74, January 1948.

Disease of the mother may result in fetal death, disability, defect of the developing child or in no manifest effect. An interpretation of the pattern of developmental anomalies is accomplished by plotting as abscissae agents involved in fetal disease against ordinates representing the successive stages of intrauterine development. This results in a grid on which certain points represent associated cause and effect. German measles remains the best example of an agent with its effects demonstrably related to development during the first trimester of pregnancy. Mongolism is the best example of an arrest due to multiple agents acting about the eighth week of life. Other agents may be variously grouped as infectious (syphilis), metabolic (nutritional deficiencies, anoxia) and physical (antenatal or paranatal trauma, structural disorders of the uterus). The position of the common birth injuries on the grid and the importance of such factors as anoxia, anesthesia and difficult delivery in causation are well established. Retrolental fibroplasia is interpreted as a function of a particular stage of prematurity with such factors as anoxia, placental abnormalities, hemorrhage and

intercurrent infection acting in causation. Information is not sufficiently refined for even the best observed agents, syphilis and rubella, to plot the precise period of clinical activity in relation to specific sequelae. Indeed, for a chronic disease such as syphilis, periods of activity must be inferred more from the consequences that are observed than from measurable clinical manifestations in the mother. Two principal lines of investigation are indicated. The first is a retrospective, systematic search of case records of pregnancies with field and clinical studies designed to determine the causative agents of observed defects or syndromes. The second, a follow-up study, starts with identified instances of infection or other suspected agents occurring in the course of pregnancy and ends with a compilation and analysis of observed effects. Three principal epidemiologic implications become evident in respect to causes of developmental arrests. Unrelated agents acting during pregnancy may give rise to the same type of arrest. Different types of arrest may be caused by a single agent. The resulting anomaly is a function of the stage of development at which the agent is active. 30 references. 3 figures.—*Author's abstract.*

Maternal Measles, Mumps and Chickenpox as a Cause of Congenital Anomalies. *M. J. Fox, E. R. Krumbiegel and J. L. Teresi, Milwaukee, Wis.* Lancet 1:746-51, May 15, 1948.

The purpose of the present investigation was to obtain data which would help to determine the numerical probability of anomalies in children born of women who have measles, mumps, or chickenpox in pregnancy. A survey was accordingly made of as many as possible of the married women in Milwaukee who had had these diseases in the years 1942 to 1945. Among 297 such mothers who were found, 589 children were born before and 76 were conceived and born after the maternal measles, mumps or chickenpox. The incidence of anomalies in this control group of 665 children was 0.9 per cent. There were 33 live children born to the same group of married women who had measles, mumps or chickenpox while pregnant, and one other pregnancy ended in spontaneous abortion in the second month. Of 22 children born of pregnancies complicated by mumps and of 4 children born of pregnancies complicated by chickenpox, none showed congenital defects. One of 7 children born of pregnancies complicated by measles had unilateral harelip. 8 references. 4 tables.

(*It is much easier to procure data about women who give birth to children with anomalies following an infectious disease in early pregnancy, than to procure comparable data about women whose children are normal following such an infectious disease. These statistics from Milwaukee furnish no support to the possibility that measles, mumps and chickenpox in American women are followed by the same high frequency of anomalies as was German measles in Australia in* 1941. *Many more studies of this sort must be carried out, of course, before we can be certain of the situation.*—ED.)

3. Blood, Hemopoietic System

Nutritional Status of Children. VII. Hemoglobin. *Mildred Kaucher, Elsie Z. Moyer, Ann P. Harrison, Ruth Uhler Thomas, Marjorie Macy Rutledge, Wanda Lameck and Eliot F. Beach, Children's Fund of Michigan, Detroit, Mich.* J. Am. Diet. A. 24:496-502, June 1948.

The hemoglobin levels were determined in fasting whole blood from 392 children 2 to 18 years old, by the alkaline method of Bessey and Lowry. Determinations were obtained in both spring and fall for 155 of the children. The values for all subjects ranged from 10.5 to 18.0 Gm. of hemoglobin per 100 cc. of blood, averaging 13.5. Thirty-two per cent of the values were below 13.0; 16 per cent were below 12.5; and only 4 per cent were below 12.0. No significant differences were found among values for the different groups of children or between determinations in the fall and spring. Averages for girls rose from 12.4 at 3 years to 13.4 at 10 years, followed by a slight increase in level but no evidence of consistent change for older girls. Values for boys increased from 12.4 at 3 years to 13.8 during the fourteenth year and 14.7 in the seventeenth year. 41 references. 4 tables.

(*In common with the findings of other investigators, the hemoglobin values of adolescent boys here recorded are higher than the hemoglobin values of adolescent girls.*—ED.)

The Neutralization of Heparin by Protamine. *Leonard L. Cowley and Conrad R. Lam, Henry Ford Hospital, Detroit, Mich.* Surgery 24: 97-99, July 1948.

When heparin in dosage of 1 mg. per kilogram body weight is injected intravenously into normal subjects, the blood clotting time becomes abnormally prolonged for some hours. If protamine sulfate in 2 per cent solution is injected intravenously in dosage of 1 mg. per kilogram while the heparin effect is active, the prolonged clotting time is restored to normal. This is demonstrable in both dogs and men. In other words, protamine sulfate can be used to neutralize the anticoagulant effect of heparin. A nontoxic solution for intravenous use can be easily prepared. 5 references. 1 table. 1 figure.

(*Protamine sulfate injections are occasionally given to patients with bleeding symptoms which are not controllable by other methods of treatment. Clinical improvement will sometimes follow, but the occurrence of hyperheparinemia in such patients is a matter of inference only*—ED.)

Abnormal Hemorrhage with Normal Platelet Count and Normal Clotting. *Russell L. Haden, R. H. Schneider, and Lee C. Underwood, Cleveland Clinic, Cleveland, O.* Ann. New York Acad. Sc. 49:641-46, May 11, 1948.

Five hundred and twenty-seven patients with abnormal bleeding

tendency were studied. Over three-fourths of these patients (407) showed essentially normal platelet counts and normal clotting mechanisms. It is apparent that the most important cause of hemorrhagic disease is a defect in capillary permeability rather than thrombocytopenia or a disturbance in the clotting mechanism. This may be due to damage to the endothelial cells or to the cement which binds them together. Infection, impaired nutrition, toxic effect of drugs and metabolic poisons, allergic states and anoxemia are listed as the most frequent etiologic agents. In many of these cases listed as having normal clotting mechanisms, there was a slight decrease of platelets or slightly prolonged coagulation time or bleeding time. The changes were never sufficient in themselves to produce the degree of bleeding noted clinically. These abnormalities were considered as frequently occurring added factors in hemorrhage due primarily to capillary wall damage. 3 references, 2 tables.—*J. H. Githens, Jr.*

Two Different Types of Anemia in Twins Fed with Goat's Milk. (*Due differenti quadri di anemia in gemelli allattati con latte di capra*). *Willy Taugheroni and Giovanni Perotto, University of Pisa, Pisa, Italy.* Riv. clin. pediat. 45:540-51, September 1947.

Female twins, presumably not identical, were fed goat's milk between 2 and 7 months of life. Both were normal until 5 months, at which time pallor and diminished activity constituted the presenting complaints. At 7 months of age both were studied completely. In the first the red cell count was 1.62 million, with a volume index of 1.09, 9,800 nucleated red cells including proerythroblasts and 35 per cent hemoglobin. There were 98,000 platelets per cubic millimeter. The bone marrow revealed arrested red cell maturation with basophilic erythroblasts predominating. The infant also demonstrated splenomegaly, hepatomegaly and purpura. The picture conformed closely to the classic goat's milk anemia. The second twin had a picture of the more common hypochromic anemia, with 3.04 million red cells, 45 per cent hemoglobin and a volume index of 0.60 with no immature forms. Both improved on a diet of cow's milk and cereal, with iron and liver supplements. 26 references.—*A. M. Bongiovanni.*

Anomalies of Intestinal Absorption of Fat. II. The Haematology of Steatorrhea. *W. T. Cooke, A. C. Frazer, A. C. P. Peeney, H. G. Sammons and M. D. Thompson, Queen Elizabeth Hospital and Birmingham University, Birmingham, England.* Quart. J. Med. 17:9-24, January 1948.

Extensive hematologic studies were performed in 45 cases of idiopathic steatorrhea. Anemia was a constant finding and was of two main types. In a small percentage it was macrocytic resembling pernicious anemia but with a large number of target cells and little poikilocytosis. Bone marrow examinations showed a hypercellular megaloblastic marrow which in 4 cases was indistinguishable from pernicious ane-

mia. The other group, comprising the majority of patients, showed marked variation in size and depth of staining of the red cells with moderate poikilocytosis and marked anisocytosis. Many target cells were consistently present. Sternal marrow generally showed orthoplastic erythropoiesis with a mixed picture of iron deficiency normoblasts and large atypical normoblasts. Fragility tests showed in every case but 1 a definitely increased resistance to hemolysis. This remained constant regardless of the degree of anemia. Studies of serum bilirubin, reticulocyte counts and fecal pigment excretions revealed no reliable evidence of increased red cell destruction. The response of the anemia to treatment was generally very disappointing. Liver extract was ineffective in many cases, even in some where the blood and marrow picture closely approximated that of pernicious anemia. Iron was also found to be of little value. This suggests that the deficiency was due to some other antianemia principle not present in liver. 65 references. 6 tables.—*John H. Githens, Jr.*

(*Recent experience has showed that many cases of megaloblastic anemia of the nutritional type which are refractory to liver extract will respond to folic acid or proteolysed liver.*—ED.)

The Span of Life of the Red Blood Cell. A Résumé. *Winifred Ashby, Ph.D., St. Elizabeths Hospital, Washington, D. C.* Blood 3:486-500, May 1948.

This review article marshalls the reasons for believing that, in the adult human, the life span of the red cell approximates 110 to 130 days under favorable conditions. The evidence is gathered from studies of: (a) transfusions and hemorrhage; (b) bile pigment metabolism; (c) use of differential agglutination with blood of types different from that of the recipient; (d) determination of longevity of red cells tagged with isotope N^{15}. Evidence is also cited to substantiate that the red cell is a living cell, capable of repairing its own deteriorations, rather than an inert passive hemoglobin-containing sac. 58 references.

(*Most authorities now agree with the conclusions of the author. There is need for similar studies of the survival potentiality of the red cells of children and infants.*—ED.)

Maternal Isoimmunization Without Evidence of Clinical Erythoblastosis Fetalis in the Newborn. *William L. Donohue and I. Arthur Fremes, The Hospital for Sick Children and the University of Toronto, Toronto, Ont., Canada.* J. Lab. & Clin. Med. 33:526-31, May 1948.

Two family situations are reported of maternal Rh-Hr isoimmunization which resulted in infants suffering from erythroblastosis, and in which each mother, in a subsequent pregnancy, delivered a clinically normal infant possessing at least one Rh-Hr factor against which she had had antibodies in the past. The discussion points out that instances of normal Rh-positive infants born to mothers sensitized against one or more of the Rh factors which the infant has inherited

from the father have been divided into two categories: (1) cases in which the sensitization was discovered at or near term with no clear-cut history of a previously affected infant; (2) rare cases, such as the present, with a history of a previously affected infant. 9 references. 2 tables.

Erythroblastosis Fetalis in Negroid Infants. *A. S. Wiener and I. B. Wexler, Jewish Hospital of Brooklyn, Brooklyn, N. Y.* Blood 3:414-18, April 1948.

Three Negroid infants are presented with the clinical signs and symptoms of erythroblastosis fetalis. In none of the cases was there any evidence of Rh sensitization. Two were apparently due to sensitization of the mother to the B agglutinogen, while in the third case no serologic incompatibility could be demonstrated. Since the frequency of the Rh-negative type among Negroids is between 5 and 10 per cent, it could be expected that the incidence of erythroblastosis would be from one-third to two-thirds as high as in Caucasians. Actually the disease is extremely rare in Negroids and no cases have come to the authors' attention that were due to iso-immunization to the Rh factor. Possible explanations are that the placenta in Negroids offers a more effective barrier to the passage of materials from the fetus to the mother or that the frequency of individuals easy to sensitize is low among these people. 19 references.—*Author's abstract.*

Chronic Lymphoid Leucemia in Children. *Jean Holowach, Washington University School of Medicine, St. Louis, Mo.* J. Pediat. 32:84-86, January 1948.

Doubt is cast on the accuracy of the several reported instances of chronic lymphoid leukemia in children. Criteria other than the duration of the illness alone must be considered. The absence of early thrombocytopenia, hemorrhagic tendencies and rapidly developing anemia is notable in the truly chronic form. Furthermore the immature cells dominating the peripheral blood and marrow in acute leukemia, constitute a different hematologic picture from the numerous small but more mature lymphocytes in the chronic form. The presence of characteristics of the acute type with a duration of illness beyond several months, does not justify a diagnosis of chronic leukemia. A 3½ year old white female is presented with splenomegaly since early infancy and conforming in most respects to the picture of chronic lymphoid leukemia. 5 references.—*A. M. Bongiovanni.*

Bone and Joint Pain in Leukemia, Simulating Acute Rheumatic Fever and Subacute Bacterial Endocarditis. *Mark Aisner and Thomas B. Hoxie, Boston City Hospital and Tufts College Medical School, Boston, Mass.* New England J. Med. 238:733-37, May 20, 1948.

Four children and adolescents with acute lymphatic leukemia are presented. Three had signs and symptoms simulating those of acute

rheumatic fever and 1 simulating those of subacute bacterial endocarditis. It is advisable, therefore, to perform a complete examination of the blood in all cases presenting bone or joint pain as a symptom. Any group of joints may be involved in either leukemia or acute rheumatic fever and the clinical features may be indistinguishable. There may be transient arthralgias, migratory joint pain, persistent pain in one or more joints and all the local manifestations of heat, redness and swelling. The joint pain in both conditions may be relieved by salicylates. The determination of the level of blood uric acid may be of decided value in the differential diagnosis, since this value may become elevated in leukemia. The blood level in 1 of the author's cases was 18.5 mg. per 100 cc., and at postmortem examination the renal tubules were packed with deposits of uric acid. The various bone changes in leukemia visible by roentgen study are enumerated. The cause of pain in the joints and along the bones is generally attributed to invasion by leukemic cells, although such invasion has not been consistently demonstrated. This symptom is more frequent in younger patients. 23 references.

The Skeletal Lesions in Leukemia. *Frederic N. Silverman, Babies Hospital, New York, N. Y.* Am. J. Roentgenol. 59:819-44, June 1948.

Roentgen demonstration of skeletal lesions in children with suspected leukemia is of great assistance because of the frequent absence of hematologic criteria for the diagnosis. Skeletal lesions were found in 52 of 103 infants and children examined. Twice as many males as females occurred in the 103 patients; 60 per cent were under 5 years of age. More than 70 per cent died within seven months of the clinical onset of their disease. Pallor, fever, listlessness and hepatosplenomegaly were the most frequent signs and symptoms; generalized lymphadenopathy and hemorrhagic tendencies were less frequent. Bone pain occurred in 42 patients. One child failed to show abnormal cells in the peripheral circulation at any time. Sixty-three patients had no elevation of the total white cell counts at some time during their illness; 27 had white blood cell counts persistently below 12,000 per cubic millimeter. Four types of roentgen lesions were observed: (1) transverse bands of diminished density at the ends of the shafts of long bones; (2) osteolysis; (3) osteosclerosis; (4) subperiosteal new bone formation. The lesions are nonspecific but help to differentiate leukemia from other diseases associated with fever, anemia and pain in the extremities in which bone lesions do not occur. The varied reactions of bone to focal proliferation of leukemic cells is responsible for the lesions. Sites of roentgen lesions are suggested as sites of election for marrow aspiration. The literature on skeletal lesions in leukemia is reviewed and illustrative case reports are included. 55 references. 5 tables. 11 figures.—*Author's abstract.*

Leukemia in Childhood. Preliminary Report of Response to Aminopterin. *Irving J. Wolman, Paul Eglick, Benjamin Dickstein and John Githens, The Children's Hospital of Philadelphia and University of Pennsylvania, Philadelphia, Pa.* Pennsylvania M. J. 52:474-81, February 1949.

The discovery of the inhibitory effect of 4-aminopteroyl glutamic acid (aminopterin) and related folic acid analogues upon childhood leukemia by Farber and associates makes it necessary to have a clear conception of the natural history of leukemia if one is to appraise intelligently the possible benefits of treatment. A review is therefore presented of experiences with 67 cases of childhood leukemia, which parallel those described by other authors. Of the 67 cases, 22 seemed to be myelocytic; 41, lymphocytic; 1, monocytic; 2, undifferentiated; and 1, unidentified. The onset of symptoms was more frequent in the first five years, with the peak being in the 2 to 4 year age group. There were 37 boys and 30 girls, in contrast to the more customary ratio of 2:1. All except 2 of the children were white. Pallor, enlarged lymph nodes, enlarged liver and spleen, fever, malaise, hemorrhages and acute infection at the time of recognition, were the most common clinical features. Sixteen (28 per cent) exhibited hemorrhagic phenomena of more severe degree than simple petechiae. Roentgenographic examinations of the long bones were carried out in 52; 50 per cent of these had positive roentgen changes. Transverse zones of diminished density at the growing ends of long bones were the most frequent bone changes. The leukocyte counts ranged from a low of 300 to a high of 680,000. In 30, or 45 per cent, the maximum detected count was below 20,000; in 13, between 20,000 and 40,000; in 24, above 40,000. No correlation was found between maximum detected white cell count and age or between the period of survival following onset of symptoms and the height of the count. The absolute number of immature and abnormal forms tended to increase as the disease progressed. The prognosis for length of life seemed poorer when early counts were high in abnormal forms. At the initial examinations, the percentage of leukocytes which were immature or clearly abnormal ranged from below 1 per cent to 99 per cent. With 2 patients, no leukemic cells were found on first examination. Nearly all the cases exhibited some degree of anemia and about 10 per cent were severely anemic (red cell count below 1,000,000) at the time of first observation. Bone marrow aspirations (single or repeated) were deemed satisfactory in 36 cases; 32 of these had primitive or abnormal forms characteristic of leukemia; in 2, the marrow was aplastic; in 2 others, there were no leukemic cells in early examinations.

Of 54 cases, 6 lived of less than one month after onset of symptoms and only 2 survived more than eight months. Forty-two patients failed to exhibit any appreciable response to transfusion, whereas 13 had some benefit. Of 8 children treated with aminopterin for more than a few days, the majority exhibited good remissions,

at least for a time. This drug has proved far superior to blood transfusions, urethane and other methods employed in the past for the alleviation of leukemia in childhood. Generally speaking, within two weeks after the first dose the marrow showed reappearance of megakaryocytes, a return of erythropoiesis (in some to a hyperplastic degree) and a marked diminution in mitotic activity of the white cells. There was also subsidence of the enlarged liver, spleen and lymph nodes, rise in hemoglobin level and platelet count and reversion of peripheral blood towards normal. The dosage recommended is 0.5 to 1.0 mg. per day, intramuscularly, and the child is preferably hospitalized at first. Adequate dosage for good maintenance has varied considerably. Success in treatment depends on individualizing the dosage. Ulceration of the lips, buccal mucosa or tongue have been the first signs of intoxication and occurred in all but 1 patient. Hemorrhage from the nose and gastrointestinal tract has occurred in 5 patients under treatment. It is too early to make long-term predictions as to the outcome with aminopterin. 6 references. 2 tables. 1 figure. 4 case reports.

4. *Cardiovascular System*

Treatment of an Infant with Paroxysmal Auricular Tachycardia. *Robert L. Moore, Southwestern Medical College, Dallas, Tex.* Pediatrics 2:266-71, September 1948.

An infant is reported who had 31 attacks of paroxysmal tachycardia between the age of 8 days and 5½ months. Many of the paroxysms would not stop spontaneously and heart failure would occur. Quinidine, acetyl-beta-methylcholine and digitalis were all effective in controlling the attacks. Because of violent reactions to acetyl-beta-methylcholine, this drug is recommended only if the other two fail to bring relief. A typical response to therapy is described as follows: At age 4 months "he awakened in the morning with another attack. He was given quinidine 20 mg. orally without effect. Two hours later this was increased to 40 mg. then 60 mg., 80 mg., 100 mg. and finally 120 mg. before the attack subsided. He was kept on 20 mg. of quinidine every four hours, and there were no paroxysms until a month later when he had another attack. This was stopped with a dosage of 120 mg. The next day another attack occurred which needed 140 mg. to stop it. Three days later 180 mg. was needed to stop paroxysm. His daily dosage was increased to 40 mg. every four hours." 16 references. 3 figures.

Aortic Pulmonary Anastomosis in Congenital Pulmonary Stenosis. Report of Forty-Five Cases. *Willis J. Potts and Stanley Gibson, Children's Memorial Hospital, Chicago, Ill.* J.A.M.A. 137:343-48, May 22, 1948.

In the Blalock operation for relief of congenital pulmonary stenosis, one of the large branches of the aorta (usually the subclavian) is anastomosed to the pulmonary artery to increase the blood flow through the lungs. In place of this operation, the authors have anastomosed the aorta directly to the pulmonary artery. The patients ranged in age from 4 months to 13 years. The procedure was carried out on 41 patients with tetralogy of Fallot, with 4 deaths. In 6 other patients the operation could not be completed because the pulmonary artery was too small for anastomosis. Three of these died and were found to have pulmonary atresia. Absence of a murmur preoperatively suggests the presence of a small pulmonary artery. In 1 such patient, the operation was performed successfully. One patient at exploration was found to have an Eisenmenger complex which is not remediable by anastomosis. In 4 patients, the preoperative diagnosis was tricuspid atresia. The clinical picture is like that of tetralogy of Fallot excepting that the left ventricle is enlarged and the right ventricle is small. These features are demonstrable by roentgenography and electrocardiography. Three of these patients were anastomosed successfully. In the fourth, the pulmonary artery was too small. Some patients with tricuspid atresia have a functioning patent ductus arteriosus but this can be determined at operation before the anastomosis is attempted. The operation requires use of a special clamp. Details of the operation are described and clinical diagnosis of the operable conditions discussed. Three of the 4 postoperative deaths were due to cerebral vascular accidents. The fourth child had unrecognized apical tuberculosis. No child was refused operation because of poor condition provided the preoperative diagnosis indicated a decreased blood flow through the lungs probably remediable by surgery. The longest follow-up period has been one year. All patients have a continuous humming-top murmur. Thirty-nine are free of cyanosis and greatly improved. The other 2 survivors are only partially improved. Two weeks after operation, the red blood count and hematocrit values had dropped almost to normal and the average rise in arterial oxygen saturation was 30 per cent. It is too early yet to know whether or not heart failure will develop later. 3 references, 1 table, 6 figures.

(*Although the authors report a mortality rate of only 8.8 per cent in the group in which anastomosis was completed, the over-all operative mortality for all the children (7 deaths in 52 patients) was 13.4 per cent. This should be considered in estimating a patient's chances of survival when exposed to surgery.*—ED.)

Oxygenation Studies in Congenital Pulmonary Stenosis. *G. Gullickson, J. O. Elam, M. Hammond, J. R. Paine, R. L. Varco, University of Minnesota, Minneapolis, Minn.* Am. Heart J. 35:940-47, June 1948.

Physiologic studies using the recording oximeter were made in 10 cases of tetralogy of Fallot, of which 2 representative cases are reported. Preoperatively, breathing pure oxygen, the arterial oxygen saturation increased to its peak in ten to fifteen minutes, whereas in normal subjects the saturation time was only three minutes. Postoperatively, these patients exhibited a normal saturation time. Following exercise they continued to indicate a limitation in cardiac reserve despite the establishment of a systemic-pulmonary arterial shunt. Recordings taken during operation showed a strikingly rapid increase in oxygen saturation after completion of the anastomosis and release of the clamps. Thus the oximeter can provide the surgeon and anesthetist with valuable help during anesthesia. 10 references, 6 figures.—*R. N. Paul.*

Physiological Studies in Congenital Heart Disease. V. The Circulation in Patients with Isolated Septal Defects. *J. C. Handelsman, R. J. Bing, J. A. Campbell and H. E. Griswold, Baltimore, Md.* Bull. Johns Hopkins Hosp. 82:615-32, June 1948.

Five cases of isolated septal defects were studied by cardiac catheterization. All cases satisfied the physiologic criteria for septal defects although none had been confirmed by postmortem examination. An auricular septal defect is present when the oxygen content of the right auricle exceeds that in the superior vena cava by about 2 volumes per cent. A similar difference between the right auricle and right ventricle demonstrates the presence of a ventricular septal defect. Direct evidence of a defect is obtained whenever the catheter passes into the left chambers. Two patients were found to have a ventricular septal defect, 2 had an auricular septal defect and 1 demonstrated both. In the 3 cases with ventricular septal defects the shunt was predominantly left to right although in 2 of these there was reciprocal admixture from right to left as indicated by a reduction in systemic saturation. In the 2 purely auricular defects the over-all shunt was right to left and in these patients cyanosis was marked and arterial oxygen saturation was reduced (70.5 and 79.5 per cent, respectively). In all cases with an auricular septal defect the standard exercise test was performed and in contrast to results obtained in patients with the tetralogy of Fallot there was a rise in the ratio of oxygen consumed per liter of ventilation. This is comparable to the findings in normal subjects and those with the Eisenmenger complex. Since, in the presence of a normal total cross-sectional area of pulmonary arterial bed and in the absence of pulmonary stenosis, the intracardiac shunt is expected to be predominantly left to right the 2 cases showing a right to left shunt would imply an increase in resistance of the pulmonary vascular tree. Further evidence of this increased resistance was obtained by an elevation in systolic and diastolic pressures in the pulmon-

ary artery, a marked loss of pressure head in the pulmonary vascular tree, and changes in the ratio of velocity energy: total work of the two ventricles. Whereas normally the latter ratio for the right ventricle is five times as great as for the left, in the 2 cases with a right to left shunt it was found to be 3:1 and 1:1. 25 references. 5 figures. 4 tables. —*R. N. Paul.*

5. *Chemotherapy, Drugs, Poisons, Physical Agents*

Aureomycin in the Treatment of Primary Atypical Pneumonia. *Y. Kneeland, H. M. Rose and C. D. Gibson, Presbyterian Hospital, New York, N. Y.* Am. J. Med. 6:41-50, January 1949.

Herein is the first report in the literature on aureomycin in atypical pneumonia. The series is made up of 10 adult cases and the clinical impression is that the results seemed sufficiently encouraging to warrant further trial of this new antibiotic in the disease. The dosage was roughly 6 mg. per kilogram body weight per dose, given orally every six hours. The only toxic effect noted was vomiting, which occurred in 2 patients and necessitated temporary cessation of treatment in 1. 5 references. 11 figures.—*C. Whitlock, Jr.*

Aureomycin Therapy in Human Brucellosis Due To Brucella Melitensis. *Wesley W. Spink and Abraham I. Braude, University of Minnesota Hospital and Medical School, Minneapolis, Minn. and M. Ruiz Castaneda and Roberto Sylva Goytia, Mexico General Hospital, Mexico, D. F., Mexico.* J.A.M.A. 138:1145-48, Dec. 18, 1948.

Aureomycin has been given orally to 24 patients having bacteriologically proved acute and chronic brucellosis due to Br. melitensis. There were 4 children in the series and these were given proportionately smaller dosages. Immediate therapeutic results have surpassed those obtained with any other specific therapy, including a combination of streptomycin and sulfadiazine, and toxic reactions have been mild. Unless small initial doses of the drug are used, a transitory febrile reaction may be observed associated with a drop in blood pressure. A total daily dose of 4 to 6 Gm. given over a two week period is recommended (for adults). Because several relapses occurred during the follow-up period, it is suggested that more intensive treatment may be needed. 1 references. 1 chart.

Subcutaneous Administration of a Sulfadiazine-Sulfamerazine Combination in Children. *Lawrence B. Slobody, David Lehr and Milton M. Wilbur, New York, N. Y.* Pediatrics 2:58-68, July 1948.

In the treatment of infants and children with sulfonamides, it often becomes necessary to use parenteral routes of administration. This is

a report of studies with sulfonamide mixtures subcutaneously injected. A sulfadiazine-sulfathiazole mixture was first tried but abandoned because it was found that sodium sulfathiazole caused a reaction best described as a sterile cellulitis at the injection site. Also, the blood levels were not well sustained. Preliminary studies with 6 children showed that when a 5 per cent solution of sodium sulfadiazine-sulfamerazine combination in distilled water was given (2.5 per cent of each salt), peak blood levels were reached in one hour and maintained for eight to twelve hours. Even after twenty-four hours, the blood showed appreciable amounts. Infants reached higher levels than older children. The amount of conjugated sulfonamide was very low. Treatment with this 5 per cent sulfadiazine-sulfamerazine mixture was carried out in 60 unselected children (newborn to 5 years) having a variety of acute bacterial infections. The following dosage schedule was used, based on the absorption-excretion studies. Equal amounts of both drugs were injected subcutaneously in the total dosage of 0.065 Gm. per kg. (½ grain per pound) body weight every twelve hours throughout the course of therapy. Only in severe infections, particularly meningitis, was it felt that higher doses, 0.1 Gm. per kilogram (¾ grain per pound) should be given at each twelve hour interval. The sodium salts were dissolved separately in distilled water, in 5 per cent concentration. Equal volumes were mixed just before administration. Injections were given slowly by pressure clysis in the anterolateral aspect of the thigh using each thigh alternately, or in the interscapular area. Blood levels remained at 10 mg. per 100 cc. or higher throughout the therapy. Daily urinalyses and blood counts were done. The urine contained 300 to 600 mg. total sulfonamide per 100 cc. even though alkalies were not coincidentally given. Only 5 cases developed a transient mild crystalluria and only 2 had microscopic hematuria. There were no untoward local reactions in more than five-hundred separate subcutaneous injections. One child developed a drug rash and fever. The therapeutic results compared favorably with any other sulfonamide treated group. The incidence of reactions was lower than reported for either drug alone. The fact that excessive blood and urine sulfonamide levels were occasionally encountered on this relatively moderate dosage schedule suggests that frequent blood level studies and urinalyses be done. A high fluid intake is essential. Alkalization may be employed as an added safety measure, particularly with high doses. 12 references. 1 table. 3 figures.

The Evaluation of an Effective Dosage of Caronamide (4-Carboxyphenylmethanesulfonanilide) for the Suppression of Tubular Excretion of Penicillin in Children. *F. Bruce Corneal, Gavin Hildick-Smith, Mary B. Fell and T. F. McNair Scott, The Children's Hospital of Philadelphia and University of Pennsylvania, Philadelphia, Pa.* J. Clin. Investigation 27:628-34, September 1948.

Previous research has showed that orally administered caronamide

used in conjunction with penicillin effectively increases the penicillin plasma concentration from threefold to fourteenfold. Twenty-three healthy children from 2 to 9 years of age have been studied to determine an optimal dose of caronamide for children, the minimum amount which will effectively suppress excretion of penicillin by the renal tubules. Daily caronamide doses of 0, 0.2, 0.4, 0.55, 0.70 and 0.80 Gm. per kilogram of body weight were given to these children, who then received a single intramuscular injection of penicillin, 10,000 units per kilogram of body weight. Plasma penicillin levels were determined ½, 1, 3, 5 and 7 hours after penicillin administration. It was found that 0.55 to 0.70 Gm. of caronamide per kilogram per twenty-four hours divided into six equal doses given at four hour intervals effectively blocked tubular excretion of penicillin in 20 of the 23 children studied. Failure of caronamide absorption seemed responsible for the 3 failures. Effective penicillin levels were maintained for six to eight hours on this regimen. Studies on 1 child showed that varying the dose of penicillin had no quantitative effect on the action of caronamide. Nausea and vomiting occurred in 4 patients, all having received more than 0.7 Gm. per kilogram per twenty-four hours of caronamide. A transient maculopapular rash appeared in another child. Caronamide had to be stopped because of severe sensitivity reactions occurring in 2 patients treated after this reported series was concluded. No other toxic reactions were noted. It is concluded that 0.5 to 0.74 Gm. per kilogram per twenty-four hours divided into six doses every four hours is the optimal dose of caronamide for children 2 to 9 years of age. It is suggested that smaller doses may be effective in infants with immature kidney function and that caronamide is probably best reserved for use in those conditions requiring unusually high plasma penicillin levels for adequate treatment. 15 references. 2 tables. 7 figures.—*C. Whitlock, Jr.*

(*The recent advent of the "depot penicillins" (i.e., slowly absorbed forms of penicillin), the ever-falling price of penicillin, the unpredictability of caronamide's action and the occasional nausea and vomiting produced by caronamide are factors which have combined to lessen the need for caronamide. However, it is invaluable in the occasional case requiring high plasma penicillin levels. The most commonly encountered conditions requiring such a regimen are typhoid fever, subacute bacterial endocarditis, acute or chronic osteomyelitis, pneumococcic meningitis, and lung abscess or any other surgically inaccessible soft tissue abscess. One would also give at least* 100,000 *units of sodium penicillin G per kilogram per twenty-four hours in a continuous intravenous or intramuscular drip or divided into frequent intermittent intramuscular doses when treating such conditions. It is important to follow the plasma penicillin level in such cases and to adjust the penicillin and caronamide dosage accordingly.*—ED.)

Well-Water Methemoglobinemia in Infants: Its Occurrence in Rural Manitoba and Ontario. *Harry Medovy, Winnipeg, Man., Canada.* Journal Lancet 68:194-96, May 1948.

This is a discussion of 12 cases of methemoglobinemia in infants occurring in rural Manitoba and Ontario. The water used in the preparation of the formulas came, as a rule, from poorly constructed, shallow wells, often situated on low ground and in close proximity to manure piles, pig-pen wastes, etc. Examination of water from these wells showed a nitrate content greatly in excess of 10 parts per million, which may be regarded as a safe upper limit. Ingested nitrates are rapidly reduced to nitrites and then to ammonia and excreted as such. When greatly increased quantities of nitrates are ingested, this normal mechanism becomes inadequate. The nitrates are broken down to nitrite and absorbed as such into the circulation. One molecule of nitrite ion unites with 2 molecules of hemoglobin to form methemoglobin. Methemoglobin in itself is nontoxic but is unable to carry oxygen. In some of the reported cases the methemoglobin level of the blood has reached 6 to 7 Gm., leaving only 5 or 6 Gm. of functioning hemoglobin. Well-water methemoglobinemia should be considered as a possible diagnosis in all cases of cyanosis in rural infants under 2 months of age who are artificially fed with dilute cow's milk. It does not occur in the breast fed infant or in the infant fed undiluted milk mixtures. All 12 infants in the present series recovered spontaneously within thirty-six hours after the correct diagnosis was made and the use of contaminated well-water stopped. Public health measures are urged to improve the quality of rural water supplies and to prevent the use of any water containing more than 10 parts per million of nitrate in infant feeding mixtures. 5 references.

The Toxic Manifestations of Sodium Salicylate Therapy. *J. D. P. Graham and W. A. Parker, Hobhill Hospital and University of Glasgow, Glasgow, Scotland.* Quart. J. Med. 17:153-63, April 1948.

Salicylates were administered orally, rectally and intravenously to 40 patients with rheumatic disease and to 30 nonrheumatic convalescents serving as controls in order to study the toxicity of this drug. Toxic manifestations were found to be correlated with ascending mean plasma salicylate levels: 20 to 30 mg. per 100 cc. gave rise to erythema, tinnitus, deafness, nausea and vomiting; 30 to 40 mg. per 100 cc. to albuminuria, hyperventilation, headache, vertigo and severe sweating; 40 to 50 mg. to drowsiness, acetonuria, hematuria, confusion, excitement and euphoria; 50 mg. and higher, to pulmonary edema, severe dyspnea and hemorrhage. Persistent vomiting usually responded to withdrawal of the drug for forty-eight hours and did not tend to recur upon re-institution of therapy. Pharmacologic studies indicated that the vomiting was principally cerebral with some local irritation upon oral administration of drug. Hyperpnea occurred at a mean plasma level of 32 mg. per 100 cc., and further rises in the plasma salicylate

level caused alarming dyspnea necessitating discontinuance of therapy. Human and animal experiments indicate that hyperpnea is secondary to afferent vagal stimulation to the central nervous system. Decreased serum content of CO_2 is secondary to the hyperpnea and represents a respiratory alkalosis. The giving of sodium bicarbonate increased the renal excretion of salicylates and depressed the plasma level below the threshold for hyperpnea; its effect was not due to altered pH of the blood. Tinnitus, deafness, nausea and transient vomiting indicated approach of the plasma salicylate level to 35 mg. per 100 cc. Above this level toxic manifestations were more severe and frequently necessitated modification of treatment. Hemorrhage caused a fatality in 1 patient with plasma levels above 50 mg. per 100 cc. 26 references. 2 tables. 3 figures.—*H. M. Goldstein.*

Propylthiouracil (6-propyl-2-thiouracil). *Announcement, Council of Pharmacy and Chemistry, American Medical Association.* J.A.M.A. 138:429, Oct. 9, 1948.

Propylthiouracil interferes with the formation of thyroxin by the thyroid gland. It is useful in the treatment of hyperthyroidism, thyrotoxicosis and thyroiditis. It is of no value and should not be used in other derangements of thyroid activity or in conditions not associated with hyperthyroidism. The effects of propylthiouracil medication do not appear until the reserve of thyroxin stored in the thyroid gland has been utilized. It may take several weeks for the signs of decreased thyroid activity to become manifest, particularly if the patient has received previous iodine therapy. Propylthiouracil can be recommended only for preoperative treatment or for those patients for whom operation is contraindicated. The incidence and severity of adverse reactions are unpredictable but they occur with less frequency than do those following medication with the parent compound, thiouracil. The most severe complication of propylthiouracil therapy is granulocytopenia. Less severe reactions may include leukopenia, drug fever and dermatitis. Since the mild and the juvenile types of hyperthyroidism can frequently be controlled adequately by iodine therapy alone, propylthiouracil should not be used for these patients unless the safer form of therapy proves ineffective. For severe cases of hyperthyroidism, initial doses of 50 mg. of propylthiouracil every eight hours appear to be effective in routine treatment and 50 mg. twice daily in milder cases. Iodine should be administered for two or three weeks immediately before thyroidectomy. The effective dosage of propylthiouracil should be continued until all signs and symptoms of the disease are under control. Adequate maintenance dosage may best be established by determinations of the basal metabolic rate. Patients should be instructed to cease medication and report immediately any adverse symptoms such as sore throat, fever, coryza or malaise.

(*The thyroid gland bears such a close relationship to the processes of maturation that one should attempt medical rather than surgical*

control of hyperthyroidism in the immature patient. Iodine therapy often is adequate. Prophylthiouracil has served to bring severe attacks under control. The recurrent use of medical therapy seems safer for for the young patient than does surgical removal, and should be given thorough and prolonged trial before surgery is undertaken. The physician may tend to overlook the underlying emotional factors which have aggravated the thyroid disturbance. The case study of the child with hyperthyroidism always should include a careful analysis of the emotional pattern in the child's home environment as well as that peculiar to the child. Betterment of faulty emotional patterns may accomplish more lasting benefit than will be gained either through medical or surgical therapy alone.—ED.)

6. Clinical Pathology

Hyperglycemia During Streptomycin Therapy (*La glicemia in corso di terapia streptomicinica*). *Alvaro Masi and Asvaldo Ceccarelli, Florence, Italy.* Riv. clin. pediat. 46:192-95, March 1948.

Significant elevations of blood sugar were found within one to three hours after the intramuscular injection of 50 to 200 mg. of streptomycin in 35 human subjects, 15 healthy and 20 with tuberculosis. Peak levels ranged from 170 to 220 mg. per cent by the Hagedorn-Jensen method. In 5 subjects concomitant streptomycin blood levels were plotted simultaneously showing peak levels of 4 mg. per cent in one hour. These usually preceded the peak sugar levels by two hours. Streptomycin contains aldehyde groups with reducing capacity which may produce metabolic derivatives responsible for the apparent glucose rise. However, some indirect hyperglycemic pharmacologic action of streptomycin was suggested as the possible cause and is to be further investigated. 4 references. 3 graphs.—*A. M. Bongiovanni.*

(*This article shows that an increase in reducing substances appears in the blood following streptomycin therapy. It is not established that these are glucose. It is likely that a similar rise would be noted in the cerebrospinal fluid when intrathecal streptomycin is being given.*—ED.)

A Comparison of the Results Obtained with Pernasal and Postnasal Swabs in the Diagnosis of Pertussis. *W. Chas. Cockburn and H. D. Holt, The Central Public Health Laboratory, Collindale, England.* Month. Bull. Min. Health & Emerg. Pub. Health Lab. Serv. 7:156-58, July 1948.

Three methods are used for the bacteriologic diagnosis of pertussis: the cough plate suggested by Chevitz and Meyer in 1916, the nasopharyngeal (or pernasal) swab described by Bradford and Slavin in 1940 and the postnasal swab described by Cruickshank in 1944. This paper describes a comparison of the results obtained from pairs of swabs (pernasal and postnasal) taken simultaneously from children un-

der 2 years of age suffering from or suspected to be suffering from pertussis. The postnasal swab was passed through the open mouth and up behind the soft palate, to be rubbed on the posterior wall of the nasopharynx. The pernasal swab was passed gently backwards along the floor of the nose through one or other nostril until it reached the posterior wall of the nasopharynx. It was then withdrawn and replaced in the test tube. Taking of the pernasal swab caused little disturbance and was much less difficult to do. The swabs were inoculated on Bordet-Gengou medium containing 33 per cent defibrinated horse blood and 0.3 unit of penicillin per milliliter. On 23 occasions both swabs were positive. On 7 occasions the pernasal swab alone was positive. The plates inoculated from pernasal swabs were much less contaminated with other organisms than were those inoculated from postnasal swabs, and often gave a heavy growth of Hemophilus pertussis in almost pure culture. Although the pernasal swab appears more reliable for the isolation of H. pertussis than the postnasal swab, it too may sometimes yield a negative result, even in the early stages of pertussis. 1 table. 2 figures.

7. *Endocrine System*

Thyrotoxicosis in Children (*Hyperthyreoidie bij kinderen*). *M. G. Stronk, University of Amsterdam, Amsterdam, The Netherlands.* Maandschr v. kindergeneesk. 16:111-17, April 1948.

Basedow's disease, the etiology of which is not understood, is seen occasionally in children. It is commoner in girls than in boys and in 70 per cent of the cases the first signs and symptoms are encountered about the beginning of puberty. The clinical course in childhood has a greater tendency to remissions and spontaneous cure than in adult life. Preference should therefore be given to medical treatment of this condition in children, especially since the thyroid gland plays an important part in the phenomena of growth. The usefulness of the thiourea derivatives in treatment is under study. These drugs inhibit the synthesis of thyroxin in the thyroid gland. The hyperplasia and hyperemia of the thyroid which result can be prevented by the administration of iodine or small amounts of desiccated thyroid. Iodine potentiates the action of thiouracil. This therapy can be continued for months on end, and after its cessation the manifestations of the disease in many cases do not return. There are toxic effects of these drugs of which the most important is granulocytopenia. The least toxic derivatives are methylthiouracil and propylthiouracil. It has become apparent also in animal experiments that prolonged administration of these drugs (for more than twenty months in animals) is followed by a carcinogenic action on the thyroid gland. It is not possible to give a definite scheme of treatment, for there are great individual variations. The dosage must be adjusted in accordance with the basal metabolic rate although

generally not more than 400 mg. per day is given. After the rate has fallen to normal levels, one may carry on with a maintenance dose of, for instance, 50 mg. daily. A girl of 14 was admitted to hospital with a clinical picture typical of Basedow's disease. She was treated with methylthiouracil, 300 mg. per day. The basal metabolic rate fell rapidly from plus 25 to minus 18 by which time the daily dose had been decreased to 50 mg. Treatment was then stopped. On account of a rising basal metabolic rate treatment with methylthiouracil was started again two months later but had to be discontinued temporarily because of leukopenia and granulocytopenia. Despite further small doses of propylthiouracil the basal metabolic rate rose to plus 28. Operation was eventually performed. After subtotal thyroidectomy the basal metabolism was minus 18 though the patient showed none of the signs of hypothyroidism. The size of the thyroid gland was not influenced by medical treatment. A close parallelism was observed between the fall in basal metabolism and the rise in serum cholesterol. 16 references. 1 graph.

Congenital Diabetes Insipidus Resistant to Treatment with Pitressin. *Joseph Dancis, John R. Birmingham and Stephen H. Leslie, New York, N. Y.* Am. J. Dis. Child. 75:316-28, March 1948.

A 6½ month white infant was hospitalized because of thirst and recurring episodes of unexplained fever. Study showed the febrile episodes to be dependent on the state of hydration. When fluid intake was raised to 2,400 to 2,700 cc. daily (500 cc. per kilogram of body weight) the patient remained afebrile. When the intake was restricted to what might be deemed normal (150 cc. per kilogram) the child exhibited an irregular fever. When the infant was experimentally deprived of fluids for twelve hours, her temperature rose to 104 F. and she became critically ill; during this period she steadily excreted an excessive amount of urine of low specific gravity despite severe dehydration (over 10 per cent weight loss). Pitressin administered in doses up to toxicity did not exert an antidiuretic action. In a normal infant of similar size and weight, a well marked antidiuresis was produced with pitressin. Antidiuretic substance was demonstrated in large amounts in the urine. Because of this finding and the insensitiveness to pitressin it was concluded that the diabetes insipidus was not due to deficiency of the posterior pituitary. There was no evidence of other endocrine disturbance. Investigation of renal function and mannitol and sodium *p*-aminohippurate failed to disclose any abnormalities. These tests are not sensitive enough to detect the small impairments of tubular reabsorption which can produce marked polyuria. This case is presented as that unusual variety of congenital diabetes insipidus in which the polyuria is due to a renal defect, the kidney being insensitive to normal pituitary control. 28 references. 1 table. 2 figures.

(*Descriptions of apparently similar cases have been recorded by Waring, A. J. et al., Am. J. Dis. Child.* 69:323-24, *May* 1945; *Williams,*

R. H.: J. Clin. Investigation 25:937, 1946; *and Williams, R. H. and Henry, C.: Ann. Int. Med.* 27:84-95, 1947. *Furthermore, we can testify from personal experience that cases of this kind, while uncommon, are not rare. The pathologic changes are variable. In some cases the physiologic defect of water resorption is simply part of a generalized disturbance of renal function while in others it appears to be a unique lesion.*—ED.)

8. Eye, Ear, Nose and Throat

What Causes Blindness in Children? (A Report for the Committee on Statistics of the Blind.) *C. Edith Kerby.* Sight-Saving Rev. 18:21-33, Spring 1948.

This report for 1945-1946 covers 3,689 pupils in thirty-six residential schools and eleven city school systems. The group includes sample cases from thirty-four states and the District of Columbia but coverage is approximately complete for only thirty states. It is estimated that 68 per cent of all the braille students in the United States are included. The changes in the causes of blindness over the past ten years are indicated in the accompanying table.

CHANGES IN CAUSES OF BLINDNESS, 1935-36 AND 1945-46

	Number		Net Change	
	1935-36	1945-46	Number	Per Cent
All Causes—By Etiology	2,578	2,345	−233	− 9.1
Infectious diseases	725	453	−272	−37.5
Trauma (including chemical burns)	230	158	− 72	−31.2
Poisonings	2	5	+ 3	
Neoplasms (all types)	67	89	+ 22	+32.8
General diseases (not elsewhere classified	44	29	− 15	
Prenatal origin (not elsewhere classified	1,252	1,355	+103	+ 8.2
Etiology undetermined or not specified	258	256	− 2	

Congenital blindness is the biggest problem at the present time. Research projects are already under way in this field. One concerns the relationship of German measles and other infectious diseases during pregnancy to congenital defects; this study, centered at the University of Kansas Hospitals, Kansas City, Kans., is sponsored by the American Academy of Pediatrics and the National Society for the Prevention of Blindness. Studies are also being conducted at several medical schools to discover the specific factor or factors responsible for retrolental fibroplasia. 7 tables.

Dacryocystitis of Infancy. *J. V. Cassady, South Bend, Ind.* Am. J. Ophth. 31:773-80, July 1948.

Dacryocystitis in infants is due to an imperforate lumen of the lacrimal duct with retention of infected tears in the sac. The majority of ophthalmologists advocate conservative treatment, but the author advises early probing of the nasolacrimal duct. In the 12 mm. embryo the nasolacrimal duct starts from a thickening of epidermal cells which grows down into the mesenchymal tissue and detaches itself from the surface ectoderm. This epithelial cord begins to develop a lumen by the third month; the ocular end establishes a lumen long before the nasal end and the latter is delayed approximately until birth or a little later. The last portion to become patent is the site of coalescence between the nasal sprout of the mother cord and the nasal mucous membrane. Schwartz examined 207 nasolacrimal ducts in fetuses in the eighth, ninth and tenth fetal months and found 35 per cent with atresia or an imperforate nasal ostium. Some of these were associated with a terminal cyst or bulla and were ruptured by the trauma incident to delivery. It is suggested that the reason why infection of the nasolacrimal sac is not seen more often even though a patent lumen may not exist at birth is that tears do not form at once and the need for patency does not occur until later. The parents of these 279 infants noted that the time at which tears first appeared varied from one to twelve weeks, the average time being three and one-third weeks. The lacrimal passages, if not patent at or near birth, probably become patent within the first week or two after birth, before tears start. If dacryocystitis develops, it may resolve spontaneously as soon as the patency of the duct is established. This may occur without probing the duct, but, the author believes, if the duct is not patent by two or two and one-half months, it is unlikely that the membrane will rupture spontaneously later. In 100 cases of dacryocystitis in infancy the duct was probed open at once without a trial period of conservative treatment. In almost all of these cases, attempts to wash the sac with a lacrimal syringe showed that the solution would not go through into the nose until after the nasal duct had been probed and made patent. Local treatment with antiseptics or antibiotics may clear up the infection in the sac, but it cannot remain clear and function properly until the duct lumen is open. 7 figures.

(*See Editor's note after next abstract.*—ED.)

Congenital Impatency of the Nasolacrimal Duct. *Du Pont Guerry, III and Edwin L. Kendig, Medical College of Virginia, Richmond, Va.* Arch. Ophth. 39:193-204, February 1948.

Among 200 consecutive, unselected newborn infants, 12 cases were found of congenital impatency of the nasolacrimal duct, evidenced by epiphora and mucopus on pressure over the affected sac. In every case the condition cleared under conservative measures, consisting of daily massage of the lacrimal sac and local application of penicillin ointment.

All were term infants. The authors advise conservative treatment of such cases for approximately six months and then the use of probing for those still recalcitrant. Interim infections can be controlled by the sulfonamide drugs and penicillin. Probing should be carried out with the patient under general anesthesia and not as an office procedure. This approach keeps the infant absolutely still so that gentle, unhurried probing can be carried out, reducing the chance of a false passage being made. Furthermore, the inferior meatus can be explored and the probe located and freed from overlying membrane, if need be, a step essential for success. Five other cases are referred to which were not benefited by conservative treatment and had to be probed through the superior punctum and canaliculus after dilation of the punctum. The inferior meatus was explored with a submucous elevator and the probe located and rubbed until bare metal was felt. Cure was effected in all instances. 19 references. 1 chart. 3 figures.

(*There are two schools of thought among ophthalmologists as to the best time for probing nasolacrimal ducts which are congenitally impatent. One school, as exemplified by the preceding abstract, claims that early probing is easy and safe and that prolonged conservative therapy may have dangerous sequelae. The majority of eye specialists, however, prefer local treatment first for three to six months or often longer, for the reason that in nearly all cases the infection and other symptoms can be satisfactorily taken care of by this means. Pediatricians will concur with the conservative approach. The condition is much more common than is appreciated by most ophthalmologists, whose experience tends to be restricted to those cases which are referred to them after simple remedies have failed. Many pediatricians fail to appreciate that most cases of stubborn conjunctivitis seen in the first few months of life have an impatent duct in the background.*

Six months would seem to be minimal for trial of conservative therapy. Many ophthalmologists wait for a full year. Probing, when decided upon, should wait until all mucopurulent secretion has been treated and eliminated. Otherwise there is always the possibility that a false passage may cause infection around the sac. A good procedure for clearing up secondary conjunctivitis is to instill a penicillin solution of about 500 units per cubic centimeter five or six times a day (perhaps with some added mercurial antiseptic such as mercurophen 1:16,000) combined with massage upward over the duct. Neither of these two papers mentions the theory that the duct obstruction is not congenital in origin but rather the product of scarring consequent to the silver nitrate preparation instilled into the infant eye by the obstetric attendent at the hour of birth. It will be interesting to note if the incidence of nasolacrimal duct obstruction becomes less frequent when penicillin prophylaxis against ophthalmia neonatorum replaces Credé's silver nitrate method.—ED.)

9. Gastrointestinal System

Congenital Megacolon. Results of Treatment by Spinal Anaesthesia. *E. D. Talford and H. A. Haxton, University of Manchester and Manchester Royal Infirmary, Manchester, England.* Brit. M.J. 4556: 827-28, May 1, 1948.

To evaluate spinal anesthesia in the treatment of megacolon, 12 children were examined 2 to 9 years following treatment. At the time of receiving the anesthesia the children ranged from 6 months to 13 years of age. Eight children are cured, with normal bowel function and improved mental and physical development. Two have fair improvement and require treatment to maintain bowel function; 2 are unimproved. The level of anesthesia must reach T-5. Enemas and oral liquid paraffin are essential in postanesthetic management. Good results may be anticipated when spinal anesthesia is given to children under 12 years of age. 3 references.—*B. J. Shuman.*

(*Many cases of congenital megacolon probably result from neuromuscular imbalance in the wall of the colon. Spinal anesthesia is often used to determine which patients might be improved more permanently by sympathectomy. The above report implies that spinal anesthesia itself may have a permanently beneficial effect even though the resulting nerve block is of very short duration. Although this result may seem improbable at first glance such effects on the nervous system are not without precedent. Local pain of long duration may sometimes be relieved for long periods or even permanently by local nerve block with procaine. The complex pain of causalgia may be similarly relieved. Seemingly temporary pharmacologic treatment may result in prolonged reduction of hypertension and other similar drug effects are well known. The effects of spinal anesthesia on congenital megacolon might well be tested further, employing more rigid criteria for selection of patients and prolonged observation with untreated controls.*—ED.)

10. Genitourinary System

Hemolytic Streptococcal Vaginitis in Children. *Paul L. Boisvert and Dwain N. Walcher, Yale University School of Medicine and the Grace-New Haven Community Hospital, New Haven, Conn.* Pediatrics 2:24-29, July 1948.

This study is based upon cultures taken on 286 infants and children with vaginitis. There were 37 with vaginitis due to hemolytic streptococcus, 33 due to gonococcus, and 11 due to pneumococcus. Positive nasopharyngeal cultures were obtained from 30 of the 37 with hemolytic streptococcus vaginitis. Streptococcic vaginitis was associated with 4 cases of scarlet fever, and 1 each of streptococcic pharyngitis, streptococcic fever, impetigo, erysipelas of the genitalia, streptococcic peritonitis and streptococcic osteomyelitis. The vaginal discharge was

an acute symptom in the majority of cases, though 1 child had had a history of slight vaginal discharge for several years. The vaginal discharge or physical findings were not sufficiently characteristic to be diagnostic, though there was a suggestion of more local inflammation in those children with streptococcic vaginitis and a thicker, more creamy discharge in those with gonococcic vaginitis. The patients with streptococcic vaginitis were found in all age groups though the majority were 1 to 9 years of age. There was an increased incidence during the fall and winter months. Most of the streptococci were grouped. Twenty-one were in group A, 4 in group B and 5 in group G. The bacterial types were diverse. Whenever grouping and typing of the nasopharyngeal and vaginal streptococci were done in the same patient the organisms were found to be identical. Parenteral penicillin is deemed the treatment of choice at present. 5 references, 1 table, 2 figures.

(*In the period before sulfonamide therapy the gonococcic form of vaginitis was believed to be by far the most common kind. We realize now, as is brought out well in this series, that bacteriologic cultures show streptococcic vaginitis to be more frequent than gonococcic. The apparent predominance of the latter in years gone by was really a manifestation of the chronicity and refractoriness of untreatable gonococcic infections. Clinics were seeing the same patients over and over again and receiving a false impression of high incidence. The recommendation of the authors that all vaginal discharges be cultured is worth emphasizing. Direct smear of the discharge cannot always distinguish between the gonococcus and the streptococcus.*—ED.)

11. Growth, Puberty, Adolescence

Creatinine Excretion, Growth Progress and Body Structure in Normal Children. *Earle L. Reynolds and Leland C. Clark, Fels Research Institute, Yellow Springs, O.* Child Development 18:156-68, December 1947.

It is generally agreed that the amount of creatinine excreted per twenty-four hours in the urine of human individuals increases from birth to maturity. Furthermore, the creatinine excretion rate tends to be higher in large, muscular individuals than in thin, nonmuscular individuals of the same height. Results are given of an analysis of four hundred creatinine determinations on 155 children, between the ages of 3 and 17 years. Mean creatinine excretion during this age-span ranges from 0.33 Gm. at 4 years to 1.85 Gm. at 16 years for boys and from 0.31 to 1.26 Gm. for girls. Curves for mean creatinine excretion and mean body weight show similar patterns. Norms are given for the creatinine per body weight ratio or creatinine coefficient (milligrams of creatinine excreted in twenty-four hours per kilogram of body weight); values rise in boys from 20.9 at 4 years to 27.0 at 16 years, while for girls the means rise from 18.9 at 4 years to 25.5 at 10 years, then

fall to 21.9 at 16 years. Boys and girls show about the same mean daily creatinine excretion per unit of body weight, disregarding age, between 10 and 50 Kg. of body weight. From 50 Kg. on, boys show an increasingly greater creatinine excretion for their body weight. Creatinine excretion appears to be more closely associated with muscle breadth than with bone breadth and shows little association with fat breadth. 31 references. 4 tables. 4 figures.

(*These findings confirm many previous observations*—ED.)

Individual Differences in Physical Changes Associated with Adolescence in Girls. *Earle L. Reynolds and Janet V. Wines, Fels Research Institute, Antioch College, Yellow Springs, O.* Am. J. Dis. Child. 75:329-50, March 1948.

Various aspects of individual variation in female sexual maturation are described, based on an analysis of five hundred and fifty-seven semiannual examinations of 49 girls. The characteristics being discussed include the maturation, size, shape and areolar protrusion of the breasts; development of pubic hair; menarche and the interrelations of these maturational features. The relation of body size to sexual maturation is examined briefly. States of maturation and interrelations of breasts and pubic hair are illustrated and average ages at attainment of various states given. Individual differences in maturational status at menarche are described; examples of maturational asymmetries are showed and individual variations in the interrelations of chronologic age, menarche and maturational status are illustrated. Two aspects of individual differences in the association of body size with sexual maturation are examined: the relation of weight and height; height index at 8 years of age to age at menarche; and the growth progress of early and late maturing girls. Other characteristics being analyzed, to be reported on in subsequent papers, include axillary hair, osseous development, menstrual patterns, differential tissue growth, growth of body segments, physiologic function and endocrine activity during adolescence. The present study offers preliminary materials for further research in the variability of human sexual maturation and provides a certain amount of information for the clinician interested in problems of adolescent development. 16 references. 21 figures.—*Author's abstract.*

(*This careful study is an example of the type of investigation needed for proper interpretation of physique. Many statements commonly accepted relating to growth and development require validation. Until careful anthropometric examinations of general population groups have been made and the common degrees of deviation from the usual pattern have been established, the physician cannot state with accuracy whether certain conditions he may observe are within the limits of normal variation or whether they represent true abnormality. Only through careful study of the presumably normal population can we learn to define the abnormal.*—ED.)

12. History, Biography, Antiquities

See Contents for Related Articles

13. Infectious Diseases, Acute

Penicillin in the Treatment of Diphtheria and the Diphtheria Carrier State. *John D. Crawford, Massachussetts General Hospital, Boston, Mass.* New England J. Med. 239:220-23, Aug. 5, 1948.

In 45 patients with acute diphtheria and 52 chronic carriers of virulent Clostridium diphtheriae, 20,000 units of penicillin were given intramuscularly at three hours intervals for fifty doses. The acute cases also received diphtheria antitoxin. Eighty per cent of the acute and 87 per cent of the carrier cases had negative cultures after the course of penicillin. The remainder became negative after tonsillectomy or a second course of penicillin or both. Penicillin was most effective when given in small quantities over an extended period of time. It was least effective as a local spray to the nasopharynx. 6 references, 3 tables. —*B. J. Shuman.*

How Long Does Immunity to Diphtheria Last? *Eli Eichelberger, Department of Health, York, Pa.* Am. J. Pub. Health 38:1234-38, September 1948.

A review of the morbidity reports from the health departments of Pennsylvania, New York, Massachusetts and California for a two year period reveals that no age group is immune to diphtheria. A Schick testing program was conducted in three junior high schools and a large senior high school in York, Pa. Of previously immunized pupils it was found that 20 per cent of 1,250 pupils in junior high schools and 18 per cent of 1,119 pupils in senior high school had a positive Schick test. In this group, an interval of five to twelve years had elapsed since the original diphtheria immunization, depending upon the age and the grade of the individual tested. Booster doses of 0.5 ml. of alum-precipitated diphtheria toxoid were given to the 449 pupils found positive. It is concluded that diphtheria immunity is often not lifelong and that approximately 20 per cent of individuals immunized as children will require a booster dose of toxoid to protect them adequately as adults. 11 references, 4 tables.

Treatment of Infantile Diarrhea with Streptomycin and an Oral Amigen Mixture. *Elvira Goettsch, George Cobley and Mary Mulloy, Los Angeles, Calif.* Pediatrics 2:1-20, July 1948.

To avoid prolonged starvation in diarrhea, a suitable oral preparation of amigen has been fed early in the course to cover the electrolyte and metabolic deficiencies. The original oral amigen mixture was

designed to simulate the composition of skim milk, with additional sodium chloride; later the mineral content was reduced. The present mixture contains 33 per cent dry powdered amigen, 62 per cent glucose and 5 per cent added salts; when fed in 10 per cent solution, the mixture is acceptable to young infants. It is fat-free, simulates the protein and sugar content of milk and contains about half the concentration of calcium, potassium and phosphorus found in milk, with somewhat higher sodium and chloride levels. A practical advantage to the use of early oral amigen is the elimination of prolonged intravenous administration and safe administration of potassium. During a severe epidemic of infantile diarrhea in 1945 the treatment consisted of the customary parenteral replacement of fluids, sulfonamides, penicillin and early oral amigen. A survey of 101 infants revealed a morbidity of 40 per cent, with an uncorrected mortality of 20 per cent; the corrected death rate was 7 per cent. Of particular interest was the predominance of gram-negative organisms of the colon group in cultures obtained from the nasopharynx, ears and catheterized urine of those infants with protracted diarrhea. Later, critically ill infants received streptomycin as soon as gram-negative organisms were found by culture; more recently streptomycin has been given immediately on admission to seriously ill infants. The dose for larger infants was 1 Gm. of streptomycin daily in divided doses every three hours, 0.5 Gm. intramuscularly and 0.5 Gm. orally; for small infants half this dosage sufficed. Forty-four infants with parenteral diarrhea received streptomycin, with 3 deaths, an uncorrected mortality of 7 per cent and a corrected mortality of zero; no deaths could be attributed to diarrhea. The use of streptomycin and the oral amigen mixture as adjuncts to the routines employed in previous years has effectively shortened the hospital stay, decreased the amount of intravenous therapy and reduced the mortality rate. 60 references. 5 charts. 4 tables.

(*In the treatment of diarrhea, replacement of water and electrolyte comes first. Continued losses often can be adequately covered by oral therapy with sufficient water, sodium, chloride and potassium. Glucose does not seriously increase water loss or interfere with intake of fluids. This paper indicates that amino acids are well tolerated. The more severely ill infants require parenteral therapy. Confirmation of the favorable effect of streptomycin as here reported is desirable since adequate fluid therapy is so effective that improvement with antibiotics is difficult to evaluate.*—ED.)

Studies of the Acute Diarrheal Diseases. XIX. Immunization in Shigellosis. *Albert V. Hardy, Thelma De Capito and Seymour P. Halbert, Public Health Service.* Pub. Health Rep. 63:685-88, May 21, 1948.

Shigella vaccines of several types, i.e., of the bacteria killed by heat, formalin or ultraviolet light, given in one series of injections or employed in repeated immunizations, had no practical value in the prevention of Shigellosis. In one institution the rate of infection was 53

per cent for the controls and 51 per cent for the vaccinated individuals. 12 references. 2 tables.—*M. M. Sigel.*

Postvaccinal Encephalitis. A Report of 45 Cases in New York City. *Morris Greenberg and Emanuel Appelbaum, New York City Department of Health, New York, N. Y.* Am. J. M. Sc. 216:565-70, November 1948.

Forty-five cases of encephalitis occurred in New York City in 1947 following the vaccination of about 5,000,000 adults of all ages. Three patients were in the age group 1 to 4 years; 3, 5 to 9 years; 4, 10 to 14 years. All the others were above 14 years of age. There were 4 deaths. No fatal case showed lesions in the brain characteristic of postvaccinal encephalitis. 25 references. 2 tables.

(*It is surprising that typical demyelinating lesions were not found It is known that they are not uniformly present in patients with postvaccinal encephalitis, for instance, when death occurs early in the disease. The authors of this article do not give the duration of symptoms in the fatal cases. In the absence of the typical demyelination the dignosis in the fatal cases, at least, cannot be established beyond doubt. It is interesting that in 4 other cases in whom the diagnosis of postvaccinal encephalitis was made, and death ensued, postmortem examinations showed the presence of tuberculous meningitis in 2, brain tumor in 1 and coronary occlusion in 1.*—ED.)

Vaccination Against Influenza A and B. A Comparison of Reactions, Doses and Titer Responses of Two Different Vaccines in Infants and Children. *R. I. Lienke, E. Perry Crump and John M. Adams, Minneapolis, Minn.* New England J. Med. 238:593-95, Apr. 22, 1948.

A comparative study of the reactions and antibody responses to two different influenza vaccines was made in 245 children ranging in age from 1 to 16 years. Combined A and B vaccines, prepared by erythrocyte adsorption (E-A) (Erythrocyte adsorbed vaccine supplied by Eli Lilly & Co.) and calcium phosphate adsorption (C-P) (Calcium phosphate adsorbed vaccine supplied by Parke, Davis & Co.) were administered subcutaneously in five groups as follows: 0.5 ml. E-A; 0.5 ml. C-P; 1.0 ml. E-A; 1.0 ml. C-P; unvaccinated controls. Body temperature increases ranged from 0 to 4.6 F., with more frequent and higher elevations in the groups receiving E-A vaccine. C-P vaccine resulted in more local erythema, swelling and induration. Systemic reactions (headache, restlessness) were more frequent and severe with E-A vaccine. One milliliter of E-A vaccine caused a convulsion in a 1 year old child. It is recommended that children under 3 years of age should not be given more than 0.5 ml. of vaccine. Attention is called to the possibility of allergic reactions and the advisability of skin testing. Titers before and fourteen days after vaccination were determined by the red cell agglutination-inhibition test, using Hirst's photodensitometric method. The geometric means after vaccination were significantly

higher than the controls. The majority of the subjects whose titers failed to rise appreciably had high initial titers. Significant differences between vaccines or doses of the same vaccine could not be demonstrated. 6 references. 3 tables.

(*This is one of numerous studies being currently reported on anti-influenza vaccination. It shows that the vaccines evoke some immunologic responses believed indicative of active immunity. The authors are noncommittal concerning the indications for use of the vaccines.*—ED.)

Infectious Croup. *Edward F. Rabe, New Haven, Conn.* Pediatrics 2:255-65, September 1948; 2:415-27, October 1948; 2:559-66, November 1948.

I. ETIOLOGY

Infectious croup is defined as a disease of the upper respiratory tract characterized by inflammation of the rhinopharynx with downward spread of the infection leading to variable degrees of obstruction of the laryngeal, laryngotracheal and laryngotracheobronchial passages. The obstruction is due to edema and is aggravated by membrane formation. Among 347 cases of infectious croup, three etiologic categories were established: diphtheritic croup, Hemophilus influenza type B croup and so called virus (nonbacterial) croup. In 22 cases of diphtheritic croup, C. diphtheriae were recovered from the rhinopharynx in 100 per cent. No antemortem blood cultures were positive although C. diphtheriae were recovered from the blood postmortem in 4 of the 5 fatal cases. Of these 3 also had a pneumococcic bacteremia. In 28 cases of croup due to H. influenza type B, rhinopharyngeal cultures yielded the organism in 96 per cent of the cases (82 per cent type B, 14 per cent not typed); 89 per cent of the blood cultures were positive for influenza bacillus. The remaining 297 cases of virus croup were so classified on the basis of a consistent symptom complex. The incidence of potential pathogens was not significantly different from normal children. Low leukocyte counts and rare bacteremia (0.3 per cent) strengthened the inference that a nonbacterial agent was responsible for this form of infectious croup. The clinical divisions of infectious croup, i.e., laryngitis, laryngotracheitis and laryngotracheopneumonitis were of prognostic value but had no etiologic significance. 11 references. 7 tables. 1 chart.

(*While there can be little doubt that the author was dealing with forms of croup due to C. diphtheriae, H. influenza and a nonbacterial agent, presumably a virus, there are many who will disagree with his inference that other organisms, such as streptococci and staphylococci, are not also etiologic agents. His method of eliminating these organisms on statistical grounds is open to question. The predominant causative organism may vary from year to year.*—ED.)

II. "VIRUS" CROUP

The incidence, pathology, clinical course and treatment of 297 cases of so-called virus or nonbacterial croup are discussed in detail and

contrasted with the bacterial forms of infectious croup. So-called virus croup occurred in 86 per cent of 347 cases of infectious croup. The disease showed yearly fluctuations in incidence over the ten year study period but was consistently an infection of the colder months (Oct.-Apr.). It occurred more frequently in male children (70 per cent) than in females and was predominantly a disease of children under 3 years of age. Allergy per se did not play a demonstrable role in causation. Endoscopically virus croup is characterized by mild supraglottic and moderate to marked subglottic edema or edema involving principally the region of the true cords and ventricle. This is in contrast to the epiglottitis and supraglottic edema of croup due to H. influenzae, type B, and the membranous pharyngitis, laryngitis and tracheitis of diphtheritic croup. The postmortem pathology of so-called virus croup is distinct from that of croup due to bacteria. It is similar to virus influenza in man and virus laryngotracheitis in chickens. Clinically virus croup is a progressive disease with downward spread of the infection in the respiratory tract. The inflammation can extend to various regions resulting in the clinical forms of the disease known as laryngitis, laryngotracheitis or laryngotracheopneumonitis. The mortality increases as the disease spreads down the respiratory tract. The most frequent complications are catarrhal otitis media and pneumonitis. The third most frequent complication and the most severe (mortality 43.3 per cent), is some form of extra-alveolar intrathoracic air (mediastinal emphysema, pneumothorax). The most common cause of death is respiratory tract obstruction. No specific treatment for virus croup was found. Steam therapy was used in all cases. Sulfadiazine is recommended for all infectious croup patients until cultures of the rhinopharynx and blood assure the absence of potential pathogens, especially H. influenzae, type B. Continued chemotherapy should be given all patients severely ill with the disease or those harboring potential pathogens. Twelve per cent of the patients were tracheotomized. It was concluded that early tracheotomy performed on a previously inserted bronchoscope, the liberal use of moist oxygen inhalations, bronchoscopic removal of crusts in the respiratory tract and early detection and aspiration of extra-alveolar intrathoracic air were the measures best suited to lower the mortality in the severe forms of "virus" croup. 23 references, 6 tables, 2 charts.—*Author's abstract.*

III. HEMOPHILUS INFLUENZA TYPE B GROUP.

Croup due to H. influenzae type B occurred in 8 per cent of a group of 347 cases of infectious croup. Its highest incidence was in the months of November through February and in male children from 3 to 7 years of age. Pathologically, it was distinguished by marked supraglottic edema and minute submucosal abscesses in the epiglottis, larynx and trachea. Clinically, this form of croup was characterized by the suddenness of onset, severity of symptoms and rapid progression. The outstanding signs and symptoms were severe sore throat, marked

epiglottitis with supraglottic edema, extreme early prostration (shock) and tender anterior cervical adenitis. A marked leukocytosis with high polymorphonuclear percentage was frequent. Treatment consisted of two parts, relieving the respiratory tract obstruction and combating the bacteremia and toxemia. Tracheotomy was needed for nearly half the cases. (Intubation is contraindicated.) Medical treatment consisted of transfusions of whole blood plus early administration of a sulfonamide and type-specific rabbit antiserum. All of the patients who received an adequate trial of specific therapy (23) survived. Twelve patients received only a sulfonamide, whereas 11 other survivors received a sulfonamide plus type-specific rabbit antiserum. Complications were the result of the invasiveness of the bacterium and the mechanical effect of respiratory tract obstruction. Death usually occurred within four to twenty hours of the onset. In the 5 fatal cases death was attributed to bacteremia, toxemia and progressive respiratory tract obstruction. 18 references. 2 tables.—*Author's abstract.*

Mumps Meningoencephalitis in Children. *Shu-Chin Lin, The Shanghai Public Hospital for Children, Shanghai, China.* Nat. M. J. China 34:97-103, February 1948.

During an epidemic of mumps in the winter 1946, Lin collected 7 cases of meningoencephalitis; in 5 the nervous system signs preceded the mumps by three to five days and in 2, followed it. The patients were aged 5 to 7 years. The course was benign and all recovered in seven to ten days after onset. 15 references. 1 table.—*C. L. Kao.*

(*Meningoencephalitis more frequently succeeds than precedes the onset of parotitis but in a considerable number of cases it occurs without apparent glandular involvement. These latter cases can be recognized by means of the complement fixation test.*—ED.)

The Immunizing Efficiency of Diphtheria Toxoid when Combined with Various Antigens. *L. Greenberg and D. S. Fleming, McGill University, Montreal, Que., Canada.* Canad. J. Pub. Health 39:131-35, April 1948.

Using guinea pigs, it was found that the combining of diphtheria toxoid with other antigens enhances the immunizing efficiency of the diphtheria toxoid. In a previous experiment it had been showed that the concentration of pertussis organisms usually found in commercial preparations at least doubled the Schick-negative inducing efficiency of diphtheria toxoid. The present experiments show that when a third antigen such as tetanus toxoid or scarlet fever toxin is added to this combination, the Schick-negative inducing efficiency of diphtheria toxoid is increased fivefold to tenfold. 2 references. 3 tables.

Antibody Formation in Early Infancy Against Diphtheria and Tetanus Toxoids. *Jean V. Cooke, St. Louis, Mo.* J. Pediat. 33:141-46, August 1948.

This reports a study of the ability of infants to produce specific

antibodies against diphtheria and tetanus, using antitoxin titers as indicative of some clinical immunity. The subjects were 284 healthy infants, white and Negro, ranging from 1 to 14 months of age. Approximately one-third were under 3 months of age at the first visit, one-third between 3 and 6 months of age and one-third between 6 and 14 months. At the first visit, blood was tested for diphtheria and tetanus antitoxins, and 1 cc. of a combined diphtheria and tetanus toxoid precipitated by aluminum hydroxide was given subcutaneously. A second injection was given two months later and one month after this second injection a blood sample was again tested for antitoxin content. No unusual local or general reactions followed the injections. With respect to tetanus antitoxin, none of the 284 infants tested before injection had detectable amounts in the blood. Of 181 retested one month after injection of toxoid all but 7 had one unit or more of antitoxin per cc. Four of these 7 were under 3 months of age at the first toxoid injection and 3 were between 6 and 14 months. With respect to diphtheria antitoxin, 228 (80 per cent) of the 284 infants had less than 0.03 unit of antitoxin per cubic centimeter before immunization. Of those under 3 months of age, about one-third had antitoxin; of those from 3 to 6 months old less than one-fifth had a passive immunity and in the infants over 6 months less than 4 per cent had antitoxin. After immunization, 191 of the infants were re-tested. In the group of 75 infants under 3 months of age, one-third failed to reach a titer of 0.1 unit or more; of those from 3 to 6 months almost 90 per cent and of those over 6 months, 95 per cent had developed this concentration of antitoxin, which is taken as indicative of diphtheria immunity. Examination of the data showed that of the 52 infants under 3 months of age who had had less than 0.03 unit of antitoxin before the toxoid injections, 83 per cent exhibited a rise to above 0.1 unit in titer. In contrast, of 23 similar infants who had had some antitoxin before the inoculations, only 30.4 per cent rose to this titer level. This interference with antibody production was ascribed to the passive immunity already present and derived from the mother. The antitoxin response to tetanus is interpreted as demonstrating that the infant has an effective capacity for antibody formation even in the early months of life, and suggests that active inoculations against whooping cough may be carried out in early months of life without fear that the immunization will be adequate. As for diphtheria and tetanus these are such a slight hazard to young infants in the United States that it would appear advisable to defer active diphtheria immunization until after the sixth month since at this time the highest percentage of active immunes would be obtained. It is the authors' custom to give pertussis vaccine at the sixth, ninth and twelfth weeks, and combined diphtheria and tetanus toxoids in the seventh and ninth months. 7 references, 5 tables.

Diphtheria Immunization with an Alum-Precipitated Mixture of Pertussis Vaccine and Diphtheria Toxoid. *Joseph A. Bell, U.S.P.H.S., Bethesda, Md.* J.A.M.A. 12:1009-16, July 17, 1948.

An intensive epidemiologic study was carried out to determine whether the addition of pertussis vaccine to diphtheria toxoid would influence the resulting protection against diphtheria. A mixed and an unmixed alum-precipitated diphtheria toxoid were prepared respectively by dividing a lot of fluid toxoid into two parts, and mixing pertussis vaccine with one part and adding physiologic saline solution to the other part prior to precipitation. Each dose of the mixed and unmixed product contained the same quantity of toxoid. Two doses of one or the other product were given with a four week interval to children 2 to 23 months of age who attended health clinics over an eighteen month period. Children born in an odd month received the mixed product and those born in an even month, the unmixed product. One year after immunization Schick tests were read on each child without knowing which type of toxoid had been used. Of all the fifteen different attributes which were thought might influence diphtheria immunity none affected the occurrence of Schick positives except the type of product given, the age at time of injection, the number of doses given and the presence of other young children in the household. The latter remains for further study. The children who received only one dose of either product were poorly immunized. Fifteen per cent of the 423 children who received two doses of the unmixed product were Schick positive whereas only 5 per cent of the 472 receiving two doses of the mixed product were positive. With respect to age at time of injection of the unmixed product 21 per cent of the 187 children receiving two doses at 2 to 5 months of age were positive whereas 10 per cent of 236 who received their second dose at 6 to 23 months of age were positive. With respect to age at time of injection of the mixed product 8 per cent of 201 children receiving two doses at 2 to 5 months of age were positive whereas 3 of 271 receiving the second dose at 6 to 23 months of age were positive. The alum-precipitated mixture of pertussis vaccine and diphtheria toxoid gave much better protection against diphtheria as measured by the Schick test than ordinary alum-precipitated diphtheria toxoid not mixed with other antigens. Although both products were better prophylactics against diphtheria when the second dose was given at 6 to 23 months of age, the mixed product was so superior that it immunized at 2 to 5 months of age as well, if not better, than the unmixed product given at 6 to 23 months of age. 13 references, 5 tables. —*Author's abstract.*

(*This is one more contribution which stresses that combinations of the antigens used for childhood protection seem to be more effective in provoking tissue and antibody reactions than are the antigens given singly.*—ED.)

Pertussis Immunization with Two Doses of an Alum-Precipitated Mixture of Diphtheria Toxoid and Pertussis Vaccine. *Joseph A. Bell, U.S.P.H.S., Bethesda, Md.* J.A.M.A. 15:1276-81, Aug. 7, 1948.

An intensive epidemiologic study was carried out to determine whether two doses of an alum-percipitated mixture of diphtheria toxoid and pertussis vaccine containing only ten thousand million phase 1, killed H. pertussis organisms per dose and given at four week intervals would confer substantial protection against clinical pertussis. The test product was prepared simultaneously with a control product consisting of ordinary alum-precipitated diphtheria toxoid. The products were given to all children 2 to 23 months of age who attended health clinics in Norfolk, Va., from Jan. 1942 to July 1943. The test product was given to children born in an odd month and the control product to those born in an even month. The products were prepared and given, and the study conducted in such a way that those giving and receiving the products did not know that pertussis vaccine was under study. Every child receiving one or more doses of the test or control product has been kept under monthly medical surveillance to date unless he left the study area or otherwise could not be located. The medical observers kept detailed clinical records on the occurrence of pertussis, measles, chicken pox, mumps and all attributes which might affect these diseases. During the observation period none of the observers could identify which child received the test or control product and there was no way in which the data could be biased in favor of either group. Specific clinical criteria for diagnosis were predetermined. The analysis confirmed that the epidemiologic procedures were adequate and that the groups were comparable. The 1,238 study children were observed for an average period of four years. Throughout the observation period measles, chicken pox and mumps occurred in almost equal proportions in the test and control groups. In striking contrast the occurrence of pertussis was much less in the test than in the control group. The occurrence of pertussis prior to the first dose was nearly equal in the two groups. The experience after the first dose showed that the 407 children receiving two doses of the mixed product had an average annual attack rate of 3.3 per cent whereas the 385 children receiving two doses of the control product had an average annual attack rate of 11.4 per cent. The same marked difference between the test and control groups was manifest no matter whether the children received their first dose at 2 to 4 months of age or at 5 to 23 months. A separate analysis showed that the difference between attack rates in the test and control groups increased markedly when more strict criteria were used for clinical classification of a case. This gave objective evidence that clinical pertussis was not only prevented but modified by the vaccine. General and local reactions to the vaccine were few and negligible. 9 references. 3 tables.—*Author's abstract.*

(*In brief, this study indicates that an alum-precipitated mixture of tetanus toxoid and killed pertussis organisms will succeed in pro-*

tecting many but not all the children against pertussis. It furnishes no evidence for or against the value of pertussis vaccine mixed with tetanus toxoid as compared with pertussis vaccine given alone. The study is important also from the point of view of the number of pertussis organisms which were used in the antigen. There has been a tendency on the part of competing biologic houses to put more and more organisms in their antigens—a procedure which is not only unnecessary but can increase the constitutional reactions to the material. This study confirms Sako's belief that when pertussis organisms are mixed with alum about one-half as many are required as when they are suspended in saline.—ED.)

The Use of Combined Antigens in the Immunization of Infants. *Donald S. Fleming, Louis Greenberg and Esther M. Beith, McGill University, Montreal, Que., Canada.* Canad. M. A. J. 59:101-105, August 1948.

Nearly 200 infants, with an average age of 4 months were given prophylactic immunizations using diphtheria toxoid, pertussis vaccine and tetanus toxoid. Each preparation, depending upon its components, was designed to provide 30 Lf diphtheria toxoid, 8 Lf tetanus toxoid and 19 billion (19×10^9) H. pertussis organisms per cubic centimeter. No severe reactions from any of these materials were noted. Two inoculations were given three weeks apart. For each preparation one-half the subjects received 1.0 cc. on each occasion, the others 0.5 cc. A sample of blood (approximately 5 cc.) was taken prior to the first inoculation and another three weeks after the second inoculation. At the onset, none of the children possessed agglutinins against H. pertussis; only 33 per cent had as much as 1/500 unit of diphtheria antitoxin; and only 6 per cent had at least 1/1,000 unit of tetanus antitoxin. Of 2 infants who possessed as much as 1/100 unit of tetanus antitoxin both mothers had been immunized during war service. The analysis of response to diphtheria toxoid was restricted to those infants with no measurable amount of diphtheria antitoxin prior to inoculation. It was found that the effectiveness of diphtheria toxoid was increased by the simultaneous administration of other antigens. The enhancement of effect was fourfold when pertussis vaccine was combined with diphtheria toxoid and seventeenfold when tetanus toxoid was added to this mixture. When response was judged by the rapid slide agglutination test, the mixture of pertussis vaccine and diphtheria toxoid was only twice as effective as with pertussis vaccine alone. The response was increased fourfold when judged by test tube agglutination. The addition of tetanus toxoid to the above mixture resulted in an actual though slight decrease in effectiveness. It is assumed that higher agglutinin levels would have been found in all groups had a longer period than three weeks after the second inoculation been allowed to elapse before the antibody titers were determined. In general, the two doses of 1.0 cc. spaced three weeks apart resulted in a greater antibody response than did two 0.5 cc. doses of the same material. 8 references. 5 tables.

The Treatment of Tetanus. Report of Two Cases with Critical Comment on New Therapeutic Resources. *Ruth C. Harris, Thomas F. McDermott and Fernand L. Montreuil, New York, N. Y.* Pediatrics 2: 175-85, August 1948.

At the present time there are many new agents available for aid in control of the symptoms of tetanus if the patient can be kept alive during the acute fulminating period of the disease. A patient is described who survived an apparently fatal infection. A second patient who was only moderately ill is also presented in detail. Both were treated with large doses of antitoxin, curare, penicillin and sulfadiazine, tracheotomy and sedation. With the first patient, 2.5 per cent sodium pentothal solution was given intermittently for fifteen days, supplemented with paraldehyde, chloral hydrate and sodium phenobarbital. The combined efforts of all departments of the hospital were utilized and a team comprised of members of the house staff maintained a twenty-four hour vigil for a two and one-half week period. With the second patient, sodium pentothal was needed only during the first three days of the illness. Both patients recovered. Sodium pentothal was chosen because of its prompt action when given by vein, minimal toxicity to the liver and noncumulative action. Some degree of tolerance developed and other sedatives were added to supplement its effect, such as d-tubocurarine chloride (Squibb) in wax and peanut oil (1 cc.=30 mg. or 175 units) given intramuscularly. Tracheotomy was performed prophylactically to prevent fatal laryngospasm and therapeutically to provide an adequate airway and exit for accumulated thick gelatinous secretions. Few reports of its use in this disease have appeared. The procedure appeared to be of great benefit. Adequate, regular aspiration of the tracheotomy tubes was mandatory while the patients were severely ill and receiving deep sedation. Oxygen under positive pressure could be administered through the tracheotomy tube for respiratory arrest. A simple apparatus for this purpose is presented. 20 references, 2 charts, 1 figure.

An Unidentified, Filtrable Agent Isolated from the Feces of Children with Paralysis. *G. Dalldorf and G. M. Sickles, New York State Department of Health, Albany, N. Y.* Science 108:61-62, July 16, 1948.

A filterable agent was recovered from the feces of 2 children ill with a mildly paralyzing disease during a small outbreak of poliomyelitis in New York State in the summer of 1947. Very young suckling mice or hamsters became paralyzed when inoculated with properly prepared fecal suspensions. The lesions were those of severe degeneration of skeletal muscle; no abnormalities of the central nervous system were found. The agent did not produce disease in older mice nor in Rhesus monkeys. It could therefore be readily differentiated from the Lansing type of poliomyelitis virus. Serum obtained during the convalescent phase of illness of each child neutralized more of the agent than did serum obtained during the acute phase of their illness. Adequate proof that this agent can cause disease in man is still lacking.—*A. L. Florman.*

Tetanus Neonatorum. *I. van der Hal, University of Groningen, Groningen, The Netherlands.* Maandschr. v. kindergeneesk. 16:119-30, April 1948.

Before World War II tetanus neonatorum in Holland was very rare; since then the number of cases has increased considerably. There are no indications that this increase is due to poorer hygienic measures. The prognosis has improved a good deal during the last few years, thanks to the use of concentrated and highly purified antitoxin and of penicillin. General nursing measures are also important. Antitoxin must be given in sufficient amounts; 100,000 to 200,000 units is the recommended dose. The tetanus bacillus is sensitive to penicillin in vitro but there is some doubt as to its efficacy clinically. The favorable influence of penicillin can partly be explained both intramuscularly and locally. Stimulants must be avoided to minimize the number of convulsive attacks. The patient must be nursed in a dark, silent room. Examination of blood and spinal fluid is omitted. The diapers are changed as infrequently as possible. Feeding by gavage is nearly always necessary; the gavage tube can be left in situ. As a sedative, chloral hydrate is used; its action can be enhanced by use of magnesium sulfate subcutaneously or by avertin rectally. 14 references. 3 tables. 1 figure.

Rocky Mountain Spotted Fever Vaccine. *New and Nonofficial Remedies.* J.A.M.A. 138:889, Nov. 27, 1948.

Rocky Mountain spotted fever vaccine is prepared from a saline suspension of membranes of embryonated chicken eggs infected with Rickettsia rickettsii. The suspension, after inactivation with formaldehyde solution, is extracted with ether to remove yolk lipids and tissue debris, leaving an almost water-clear solution which contains the immunizing antigen. There is considerable evidence that such a vaccine preparation is of value in the prevention of Rocky Mountain spotted fever (tick typhus). In the Western United States the common vector is Dermacentor andersoni which is rarely found in urban centers; while in the eastern United States both urban and rural areas may be infested with the common vector, the dog tick, D. variabilis. The vaccine leads to the development of active immunity, the duration of which is not known. Whether the vaccine should be employed depends to a large extent upon the likelihood of exposure to infection. When exposure is likely it is advisable to repeat the vaccination annually. In areas where the risk is large, the vaccine would be recommended especially for ranchers, campers and others. In areas where the disease is rare, vaccination hardly can be justified. The vaccine contains egg protein, hence should not be given to persons sensitive to egg protein. The dosage is 0.5 cc. to 2.0 cc depending on the age of the subject, to be repeated once or twice at intervals of from five to ten days.

Management of Tick Typhus (Rocky Mountain Spotted Fever) in Children. *W. M. Kelsey and G. T. Harrell, Winston-Salem, N. C.* J.A.M.A. 16:1356-61, Aug. 14, 1948.

The prevalence, severity and high mortality of tick typhus in the Eastern states are not generally appreciated. Of 27 patients in the pediatric age group, 7 died. Early diagnosis is the biggest problem. A history of a tick bite is helpful but is not always present. In the pre-eruptive stage a positive Rumpel-Leede phenomenon and a low or normal leukocyte count with an increase in the polymorphonuclear cells is suggestive. The rash usually appears first on the extremities but may involve the whole body by the time it is first noted. Certain physical findings are important early in the eruptive phase of the disease. The child is usually acutely ill and dehydrated. The pulse is rapid and the blood pressure is at the lower limits of normal. There is nearly always some generalized edema. Nearly all the patients were anemic. The white blood count early in the disease was usually normal or depressed. A later rise was frequently associated with secondary bacterial infection. The percentage of polymorphonuclear leukocytes was increased regardless of the total number of the cells. Hypoprothrombinemia was noted in several patients. The total serum proteins tended to be low. The NPN was frequently elevated and the blood chlorides were low at the time of admission. A considerable shift of fluids from the vascular to the extravascular spaces takes place and this fluid shift may be a factor in the production of peripheral vascular collapse. Abnormalities of the cerebrospinal fluid were found frequently.

The clinical course of the patient was fairly constant. Two critical periods were common: at the time of admission and on the tenth day of the disease. Electrolyte disturbances and shock occurred early in the disease; later peripheral circulatory collapse and pneumonia were common. Peripheral circulatory collapse was the most common complication, usually occurring when edema was maximal. Cardiac failure was not seen. Pneumonia developed in 45 per cent of the cases. Nearly all had signs of involvement of the central nervous system. Hyperimmune rabbit serum and para-aminobenzoic acid were used without definite benefit, although the latter drug was not given a fair trial. Supportive therapy was directed at the prevention of cardiovascular complications and pneumonia and maintenance of nutrition. Depending on the clinical state of the patient, the blood count, hematocrit and blood nonprotein nitrogen and chlorides, sodium chloride, blood plasma or washed red cells were given intravenously. Penicillin was administered when there was the slightest evidence of pneumonia. Most of the children were unable to take the amount and type of food necessary to maintain nutrition and received gavage feedings of high caloric, high protein, high vitamin content. Though there is no proof that this vigorous approach to supportive therapy has lowered the mortality rate

of tick typhus, several patients have recovered who might have died without these supportive measures.

(*Since this paper was written, chloromycetin, para-aminobenzoic acid and aureomycin have all proved to be important therapeutic agents if administered early in the disease. However, patients who are first seen late in the disease have the same need for supportive treatment as they did before.*—ED.)

Para-Amino Benzoic Acid in the Treatment of Rocky Mountain Spotted Fever. A Report of Its Use in 17 Cases. *Sidney Ross, Preston A. Mclendon, Hugh J. Davis, Children's Hospital, Washington, D. C.* Clin. Proc. Child. Hosp. 4:247-60, September 1948.

The present report gives the results in the treatment of 17 cases of Rocky Mountain spotted fever treated with PABA during the summers of 1946 and 1947 with no deaths. This is to be compared with 30 cases of spotted fever treated at the same hospital from 1931 to 1945 inclusive without PABA, in which there were 3 deaths. This difference in mortality rate in the two groups is not statistically significant but a compilation of the reported results of treatment of spotted fever with PABA lends itself to statistical analysis regarding the efficacy of the drug. A total of 51 patients including 43 children and 8 adults are on record. Of this number, 48 (94.1 per cent) recovered. This over-all mortality rate of 5.9 per cent is in contrast to the 25 per cent mortality rate which has prevailed with the eastern type of spotted fever prior to the use of PABA. There was a more rapid defervescence of fever in the authors' cases treated with PABA when compared with untreated patients. The response was gradual rather than precipitous. The impression was gained that the degree of prostration and intoxication was decreased in the cases treated with PABA. Usually by the second or third day after initiation of the drug, the patients were no longer lethargic or hyperirritable and the characteristic toxic appearance showed definite evidence of subsiding. The rash usually disappeared by the fifth to the eighth day. The drug was given for an average of six days and was usually discontinued within two to four days after the temperature returned to normal. The earlier the initiation of therapy, the better the response. Favorable therapeutic results could probably be expected if the drug is started before the seventh day. Considerable variation in the PABA blood level was achieved with comparable dosage, there being no definite linear or curvilinear correlation between dosage and blood concentration. On the average, 0.4 Gm. per pound in twenty-four hours in twelve doses every two hours was satisfactory. There were few toxic manifestations. Leukopenia without granulocytopenia occurred in some cases. Cephalin flocculation showed an increase in positivity during PABA therapy. A reducing substance which produced a green or yellow reduction with Benedict's reagent was found in 55 per cent of the urines examined during PABA therapy. This reducing substance is probably a benzoylglucuronide result-

ing from the conjugation of PABA with glucuronic acid. 16 references. 6 charts.

(*The use of para-aminobenzoic acid in treatment of Rocky Mountain spotted fever seems a definite advance over solely symptomatic remedies. More recently, however, aureomycin and chloromycetin have been showed to be even more effective* (*see next abstract*). *There are thus available three effective chemotherapeutic weapons.*—ED.)

The Treatment of Rocky Mountain Spotted Fever with Chloromycetin. *Maurice C. Pincoffs, Ernest G. Guy, Leonard M. Lister, Theodore E. Woodward, Baltimore, Md. and Joseph E. Smadel, Washington, D. C.* Ann. Int. Med. 29:656-63, October 1948.

Ten of the 15 reported patients were under 16 years of age (2 to 16) and 5 were 17 to 67. The chloromycetin was given usually at three hour intervals. The arbitrary doses employed were 0.25 Gm. every three hours for the children under age 16 years and 0.5 Gm. for those above this age. The chloromycetin was discontinued after twenty-four of normal temperature. Improvement in symptoms was uniformly noted within twenty-four hours after beginning treatment. The eruption usually subsided markedly by forty-eight hours. On the third day the patient was usually free of symptoms and clearly convalescent. In occasional instances there was some vomiting on the first or second day; there were no other toxic symptoms. Chloromycetin may therefore be deemed an effective therapeutic agent in this disease. 7 references. 2 figures.—*R. N. Paul.*

A Familial Spread of Vaccinia with One Death. Isolation and Identification of the Virus. *F. G. Gray, Johns Hopkins University and Hospital, Baltimore, Md.* Bull. Johns Hopkins Hosp. 82:538-49, May 1948.

Three members of a family developed generalized vaccinia following household exposure to a 6 month old infant who had been given a routine smallpox vaccination. The first of these, a 3 year old boy with a history of eczema, became severely ill and died. The others were the child's mother and a 4 year old brother. Neither was severely ill. The mother had had three vaccinations all of which had resulted in no takes. The incubation period, estimated from the date of vaccination of the infant to the time of appearance of lesions, was thirteen days in the fatal case and sixteen days in the others. A virus identified as vaccinia by neutralization tests was recovered from the skin lesions of the fatal case and of the mother by inoculation of rabbit corneas. Intracytoplasmic inclusion bodies were demonstrated in the skin lesions from the fatal case and the experimentally infected rabbits. 9 references. 2 tables. 2 figures.

(*It cannot be emphasized too often that the child with eczema should not be vaccinated against smallpox until the eczema has entirely cleared. Nor should any other member of the household be vaccinated,*

since transfer to the eczematous child is very apt to occur. Amorphous (crude) penicillin has been reported to have some inhibiting effect on generalized vaccinia but not the purified crystalline forms now in general use.—ED.)

The Relationship of Varicella and Herpes Zoster. Electron Microscope Studies. *Geoffrey Rake, Harvey Blank, Lewis L. Coriell, Frederick P. O. Nagler and T. F. McNair Scott, The Squibb Institute for Medical Research, New Brunswick, N. J., The Children's Hospital of Philadelphia and the University of Pennsylvania, Philadelphia, Pa.* J. Bact. 56:293-303, September 1948.

With the aid of the electron microscope, brick-shaped elementary bodies that resemble closely those found in varicella have been demonstrated in the vesicle fluid of the lesions of various clinical types of herpes zoster. In 1 instance vesicle fluid was examined from a case of herpes zoster that had apparently initiated an outbreak of varicella on a children's ward. Fluid from the herpes zoster case, a 6 year old girl, and from 3 to 13 contact cases of varicella revealed scanty but characteristic bodies in all four fluids. 13 references. 17 figures.

The Use of Rabbit Serum in the Treatment and Prophylaxis of Whooping Cough. *Martin Z. Kaplan and John B. Larson, University of Louisville Medical School, Louisville, Ky.* Kentucky M. J. 46:292-94, July 1948.

A review of the literature shows that hyperimmune human serum is valuable in protecting infants exposed to whooping cough as well as in treatment of those that have contracted the disease. The merit of hyperimmune rabbit serum has not been as thoroughly studied but the experience of those using it has been good. Hyperimmune rabbit serum was used in 49 severe cases of pertussis treated at the Louisville General Hospital during the first six months of 1947. These were reviewed and compared with those treated the preceding two years with hyperimmune human serum. The complications of pertussis in both series were treated by the liberal use of antibiotics, sulfonamides, oxygen, fluids and general supportive care. It was found that as good results were obtained with rabbit serum as with human serum and that both of these are far superior to no serum. Sensitivity reactions to rabbit serum were not encountered. The dosage of rabbit serum recommended is 10,000 units daily for three days, with more if the response is slow. 7 references. 1 chart.

(*Both human and rabbit serum seem to have proved their worth in the treatment of whooping cough in young children. The choice between them in the individual case would seem to depend largely on comparative accessibility and price and the preference of the attending physician. The use of rabbit serum carries the potential danger of sensitization of the recipient but is free from the risk of conveying homologous serum jaundice. Actually, the risk of homologous serum*

jaundice being transmitted by hyperimmune human serum is negligible for the reason that the donors who serve as immunized subjects in the production of the serum are all first screened to exclude insofar as possible the likelihood of their carrying the virus. There are no cases on record of hyperimmune serum being implicated as the transmitting agent of homologous serum jaundice.—ED.)

14. Infectious Diseases, Chronic

The Epidemiology of Rheumatic Fever. Its Public Health Aspects. *George C. Griffith, University of Southern California, Los Angeles, Calif.* Am. J. Pub. Health 38:682-88, May 1948.

The epidemiology of rheumatic fever is that of the group A hemolytic streptococcus. The incidence of rheumatic fever is dependent upon the incidence of streptococcic infection and follows it by several weeks. The peak month for rheumatic infection is April, with September and October the low months. That rheumatic fever is a contact disease and not due to inherited susceptibility is showed in a study of almost 5,000 individuals in the armed forces. The individual with a positive family history tended to develop the disease while still in contact with the family but no relationship appeared between the family history and development of the disease after separation from the family environment. Three public health measures are necessary for reduction in the incidence of rheumatic fever: (1) education of laymen and physicians; (2) case finding, which is somewhat dependent on No. 1; (3) control of streptococcus epidemics, which is the most difficult to accomplish. Oiling of floors, use of ultraviolet light and glycol vaporization all aid in decontamination of the air. Since transmission of hemolytic streptococci is difficult to control, means of preventing tissue invasion by the organism must be sought. Proper food, adequate housing and other general measures are beneficial. Chemoprophylaxis is known to be effective. Tonsillectomy does not prevent the onset of rheumatic fever nor insure against recurrence. Vaccines and serums have so far proved unsatisfactory and antibiotics are expensive and impractical at the present time. The most logical attack on the problem is the development of a blocking agent to prevent the antigen of the streptococcus from sensitizing the host. 11 references. 4 tables.—*R. N. Paul.*

Some Factors Predisposing to Juvenile Rheumatic Fever in Sydney. *Joan Storey, University of Sydney, Sydney, Australia.* M. J. Australia 1:492-502, Apr. 17, 1948.

This study was undertaken at the Royal Alexandra Hospital for Children in 1946 to 1947. Group A hemolytic streptococci were found on throat swabs in 23.7 per cent of 97 rheumatic children on admission, as compared with 5.2 per cent of an equal number of controls. Sixty-four of the rheumatic group and 65 of the controls still had their tonsils.

Of these, 38 rheumatic and 30 controls showed clinical signs of throat infection. Two hundred mothers of juvenile patients were questioned regarding preceding infections, environmental factors and family history. Forty-six per cent gave histories of respiratory tract infections which preceded the onset of rheumatic fever. Over 50 per cent of rheumatic fever patients gave a family history of the disease as compared with 35 per cent of the control group. Although rheumatic fever was found to occur more commonly in certain districts of Sydney, little difference was found with regard to the incidence of dampness and overcrowding in the homes of the rheumatic and control groups. Little variation was noted in the seasonal incidence but there was a tendency for it to be greatest towards the end of the year. There is a popular belief that blonde and blue-eyed or red-haired and freckled individuals are more susceptible to the disease but such susceptibility was not encountered in this study. The author concludes from the statistics collected that the children most apt to develop rheumatic fever are those between 4 and 12 years of age with a family history of the disease, living in overcrowded areas and exposed to group A hemolytic streptococcic infections. 53 references. 19 tables. 5 figures.—*R. N. Paul.*

Prevention and Treatment of Prenatal Syphilis. *Norman R. Ingraham, University of Pennsylvania, Philadelphia, Pa.* Am. J. Med. 5:693-701, November 1948.

Penicillin is effective in the prevention and treatment of congenital syphilis and except perhaps for interstitial keratitis may completely replace other forms of specific therapy. It is of greatest value in this field when given to the mother either prior to conception or in the early months of pregnancy, and can cure the fetus in utero if the disease is not too far advanced. A total dose of 2.4 million units (40,000 units every three hours for sixty injections) of aqueous penicillin in hospitalized pregnant women is sufficient to virtually insure the birth of a nonsyphilitic infant. Somewhat higher total dose may be desirable to effect cure in the mother. Ambulatory treatment with a slowly absorbed penicillin preparation, 600,000 units once daily for eight days, is practical and produces about the same results as aqueous penicillin. This treatment of the pregnant woman is apparently effective in all stages of syphilis and at almost any time in the pregnancy. There is some evidence that women who have received adequate penicillin treatment may need no specific treatment during pregnancy. It is still too soon, nonetheless, to withhold treatment under average circumstances of routine handling during subsequent pregnancies in women who have had syphilis. The response of the syphilitic infant to penicillin therapy depends largely upon the age and physical status at the time treatment is given. If the infant is debilitated or the victim of intercurrent infection, hospitalization and expert pediatric care are desirable. In surviving infants the cure rate approaches 100 per cent if treatment is started in the first four months. Failure of serologic response is

common if treatment is delayed for six months to two years but infectious relapse is rare. Recommended total dosage of aqueous penicillin has varied between 18,000 and 98,000 units per pound of body weight, given every three hours in one hundred and twenty divided doses over a period of fifteen days. The meager available information indicates that penicillin therapy of late congenital syphilis is at least as effective as other types of treatment previously employed. As would be expected, the serologic response is slow and uncertain in spite of satisfactory clinical improvement. Adult dosage totaling 10 million units or more over a period of fifteen days should be used in congenital neurosyphilis. Best results are obtained in interstitial keratitis when fever therapy is used in conjunction with penicillin. 44 references.—*Author's abstract.*

Penicillin Treatment of Early Congenital Syphilis. *Dabney Moon-Adams and Charlotte Marker, New York University and the Children's Medical Service, Bellevue Hospital, New York, N. Y.* N. Y. State J. Med. 48:1245-49, June 1, 1948.

Over a period of four years 69 infants with congenital syphilis have been treated with penicillin on the pediatric service of Bellevue Hospital. Clinical evidence of syphilis was present in 88.6 per cent. In the young infants, the most common findings were osseous involvement, 78 per cent and mucocutaneous lesions 50 per cent; in the older infants, anemia 80 per cent, snuffles 61 per cent and visceral involvement 60 per cent. In 11.4 per cent there was involvement of the central nervous system. Fifty-three and six-tenths per cent of the mothers had received no prenatal treatment; 37.7 per cent were treated prior to or during pregnancy; in 8.7 per cent the treatment status was unknown. As a result of the observations made with different dosages of penicillin the authors advise the use of at least 100,000 units per Kg. body weight of penicillin for congenital syphilis. The present practice of dividing the total amount of penicillin into 120 doses, given at three-hour intervals over a period of fifteen days, is probably more effective than large amounts over short periods of time. 4 references. 3 tables.

Childhood Tuberculosis in Rome During the War Years (*La tuberculosi infantile in Roma negli anni di guerra*). *Arnaldo Raimondio, University of Rome, Rome, Italy.* Pediat. internazionale 1:169-98, Jan.-Mar. 1948.

Childhood tuberculosis in Rome increased in incidence from 6.67 per cent of all illness during the prewar years to 12.18 per cent in 1944. This represented a rise in the more severe forms of the disease, including meningeal and acute miliary tuberculosis while more benign forms actually diminished slightly. Most cases during the war occurred in the age group 1 to 4 years as compared to the prewar group of 5 to 7 years. In 1944, 22.77 per cent of proved cases had negative tubercu-

lin skin reactions as opposed to 6.54 per cent in 1936; a similar increase in anergic tuberculosis had been reported by Germany during World War I. Suboptimal body weight on admission was present among 74.44 per cent of patients in 1944 as against a median of 64.04 during the prewar years. A quantitatively and qualitatively inadequate diet leading to poor general health was considered responsible for the increased incidence and severity of childhood tuberculosis during the recent war. 18 references. 7 tables.—*A. M. Bongiovanni.*

The Efficacy of BCG Vaccination. *H. Malmros, Oerebro, Sweden.* Brit. M. J. 4562:1129-32, June 12, 1948.

According to the author's statistics, BCG vaccine is harmless when properly prepared and distributed. When 0.05 mg. of the vaccine was given intracutaneously, 7.8 per cent of 22,413 vaccinated persons developed small ulcerations. Large abscesses occurred in only 0.8 per cent. Of the entire group only 1 individual later developed tuberculosis. Over 93 per cent of all vaccinated groups, including newborns, became tuberculin-positive six to seven weeks after vaccination. In Bornholm, Denmark, where 23 per cent of the population were vaccinated, a considerable decrease in new cases of tuberculosis has been noted in the 15 to 35 year age group. It is recommended that all vaccinated persons be tuberculin tested six to seven weeks after vaccination and that negative reactors be revaccinated. 18 references. 2 graphs. 3 tables. —*R. N. Paul.*

The Clinical Administration of Dihydrostreptomycin in Tuberculosis. A Preliminary Report. *H. C. Henshaw, W. H. Feldman, D. T. Carr and H. A. Brown, Mayo Clinic, Rochester, Minn.* Am. Rev. Tuberc. 58:525-30, November 1948.

Neurotoxic manifestations of streptomycin therapy are almost uniformly observed in patients when larger doses (40 mg. or more daily per kilogram of body weight) are administered for a few weeks. Dihydrostreptomycin, reputedly less toxic, was given to 14 patients with various types of tuberculosis in doses of 1.0 to 3.2 Gm. daily up to one hundred and twenty days. Evidence of severe vestibular nerve damage occurred in only 1 patient with renal insufficiency who had on one examination a high level of 320 micrograms per cubic centimeter of serum. One other patient developed mild vestibular dysfunction. In no case was there evidence of allergic response, including 1 patient previously highly sensitive to streptomycin. Irritation at the injection site was generally greater than with streptomycin. Intrathecal medication was abandoned because of severe meningeal irritation caused by doses of 50 mg. in 4 patients with tuberculous meningitis. 3 references. 1 table.—*A. M. Bongiovanni.*

(*Dihydrostreptomycin suppresses the tubercle bacillus in vitro and in vivo in much the same fashion as does streptomycin and its rate of absorption and excretion after intramuscular administration are*

also similar. Early reports indicate that in comparable dosage, its neurotoxic properties are significantly less than those of streptomycin. Dihydrostreptomycin can be substituted to advantage in patients with sensitivity to streptomycin. Edison et al. have showed that dihydrostreptomycin and streptomycin are similar in antibacterial activity against human and avian strains of Mycobacterium tuberculosis but that strains resistant to streptomycin are also resistant to dihydrostreptomycin (Am. Rev. Tuberc. 58:487, 1948). It would seem that the chief advantage of substituting this new derivative in infections due to resistant organisms is the possibility of using larger doses with less likelihood of toxicity.—ED.)

Streptomycin in Abdominal Tuberculosis in Children (*Estreptomicina en la tuberculosis abdominal del niño*). *R. Matte, S. Ibañez and A. Trautmann, Santiago, Chile.* Rev. chilena de pediat. 19:371-80, May 1948.

Ten children, 7 to 18 years of age, with abdominal tuberculosis were treated with streptomycin. Five were diagnosed as having tuberculous enteritis, 2, peritonitis and 3, mixed. All had evidence of pulmonary disease. In all there was persistent fever, anorexia, abdominal pain, intractable diarrhea and weight loss. Intramuscular streptomycin in daily doses of 1.0 Gm. or less, at intervals of four to eight hours, was given for an average of three months. The results were dramatic; particularly gratifying was the subsidence of diarrhea and improvement of appetite within one week. The disappearance of fever and weight gain were more gradual. Seven patients have showed continued improvement two to seven months after therapy and 3 remain under treatment. Final evaluation awaits further study. The course of the pulmonary lesions is not reported. 2 tables.—*A. M. Bongiovanni.*

(*This report confirms the ease with which tuberculosis of mucous membranes responds to streptomycin therapy. Regardless of the long-range effect of treatment on the disease, the dramatic alleviation of troublesome abdominal complications justifies the therapy.*—ED.)

Treatment of Tuberculosis with Streptomycin, Sulfone and Vitamin A, Miliary Tuberculosis and Tuberculous Meningitis. (*Terapia della tuberculosi con streptomicina, solfone e vitamina A, tuberculosi miliare e meningite tubercolare*). *Cesare Cocchi, University of Florence, Florence, Italy.* Riv. clin. pediat. 46:209-75, April 1948.

Miliary tuberculosis without meningeal involvement can be cured with combined streptomycin and sulfone (p-p′-diaminodiphenylsulfone-N-N′-didextrose bisulfite) therapy. Of 16 such cases, only 1 died shortly after the initiation of therapy. An additional 5, during streptomycin

treatment for the miliary type, developed complicating tuberculous meningitis which was clinically more benign than that occurring in the absence of miliary dissemination. Of the latter, 3 were definitely on the way to recovery and 2 died. Another 8 were admitted with simultaneous miliary and meningeal disease. Although 2 of these died, roentgenograms of the lungs became clear in all. Streptomycin was given intramuscularly in five divided daily doses of 0.01 Gm. per kilogram of body weight per day in older children, 0.02 Gm. in younger ones, and 0.03 Gm. in infants. This was given in at least three courses of twenty-five days each with intervals of five days. In addition 1.5 to 3.0 Gm. daily of sulfone in a single intravenous dose was used. Vitamin A, 50,000 units daily, was administered for fifteen to thirty weeks because of earlier impressions of its favorable effect on the disease. A total of 107 proved cases of tuberculous meningitis have been treated to date, of whom 46 were critically ill on admission and died shortly thereafter. With this correction there has been a mortality rate of 16 per cent to date. Treatment was by parenteral streptomycin in the above dosage. Relatively small doses of intrathecal streptomycin over long periods were considered essential to cure. Early termination because of apparently improved clinical status was dangerous. Periodic examination of the cerebrospinal fluid was deemed essential. A maximal intrathecal dose of 50 mg. per injection was used in adults, and 30 mg. or less in children. This was given daily for twenty-five to forty days; then every other day for sixty days with a subsequent interval of four days after which the fluid was studied. Thereafter cycles of treatment every two to three days for thirty to forty days were resumed pending the laboratory findings. When the fluid was once normal, weekly intrathecal injections were undertaken and the previous schedule resumed should abnormalities recur. In favorable cases the cell count returned to low levels and its chemical composition to normal. There has been an earnest desire to diminish the extent of intrathecal medication but previous experience dictates the necessity for a prolonged course. No serious sequelae to the doses used were observed. Larger doses of streptomycin by any route seem to suppress the tubercle bacillus temporarily but also inhibit the patients' natural defenses, upon which ultimate cure depends. In April 1948, 51 children were alive of the entire group and 13 were definitely cured. These had not had therapy for seven to twelve months and had been fully active without clinical or spinal fluid recrudescence. The remainder were clinically well and treatment had been suspended for less than six months or was still in progress. In the entire series, several cases with optic choroid tubercles showed complete clearing with only atrophic or pigmented areas remaining. Because of a shortage of streptomycin it was sometimes necessary to discontinue treatment with occasional relapse. In every such instance there was a good response on resump-

tion of therapy, with no evidence of bacterial resistance. 73 references. 14 tables. 49 figures.—*A. M. Bongiovanni.*

(*This paper represents an extensive analysis of streptomycin therapy in miliary and meningeal tuberculosis. The full text is recommended for many valuable details. The author's degree of success in the treatment of tuberculous meningitis challenges comparison with many other less favorable reports. The small doses of streptomycin, the long-continued intrathecal therapy, the giving of large amounts of vitamin A and the concomitant use of a sulfone derivative represent features not practiced generally.*—ED.)

Observations Concerning Local Treatment of Tuberculous Pleurisy With Streptomycin (*Osservazioni sulla terapia streptomicina locale nelle pleuriti tuberculosi*). *Lelio Nassi, Florence, Italy.* Riv. clin. pediat. 46:509-30, August 1948.

Twenty-four patients aged 4 to 14 years, with tuberculous pleurisy proved by culture, were treated with intrapleural streptomycin. The majority were discovered within five to fifteen days of onset. The best results were obtained by removal of as much fluid as possible preceding streptomycin introduction. From 50 to 300 mg. of the drug were introduced without reaction in any instance. Air was also introduced with the object of preventing pleural adhesions and further effusion. In 10 patients this procedure was performed only once and repeated 2 to 5 times in the remainder depending upon the reaccumulation of fluid. There was no other specific therapy. The median duration of the exudative stage was twenty-five days as compared to thirty-two days in a control series of 30 untreated patients. Progress was measured by physical and radiologic signs in the chest. Several months later fluoroscopy failed to reveal fluid in any and showed limitation of diaphragmatic excursion on the diseased side in only 4. Additional studies in quest of more dramatic results are planned. 2 references. 4 tables.—*A. M. Bongiovanni.*

(*Pleurisy with effusion is usually a relatively benign disease. It should not be confused with true tuberculous empyema which is much more serious and very difficult to treat. Streptomycin locally has not been very effective in the latter condition, for reasons not entirely clear. It has been suggested that the low pH of tuberculous pus may be unfavorable for the action of streptomycin.*—ED.)

Streptomycin Treatment of Tuberculous Meningitis. *Wen-Chieh Chin and Lan-Tang Liu, National Shantung University Hospital, Shantung, China.* Nat. M. J. China 34:233-38, May 1948.

Five cases of tuberculous meningitis in infants and children aged 10 months to 10 years were treated with streptomycin. Tubercle bacilli were found repeatedly in the spinal fluids. Owing to the cost and shortage of the drug, the treatment was irregular and in each case the dose had to be reduced later by one-half and the frequency of injection also

lessened. After receiving streptomycin 14 Gm., 17 Gm. and 20 Gm., respectively, in a period of forty days, 3 children showed marked improvement at first but all died within three months. One infant of 18 months received 60 Gm. of streptomycin in a period of six months and has remained well since; but in this case tubercle bacilli were not recovered. In a girl age 8, whose spinal fluid showed the organism on several occasions, streptomycin was started in the third week of her illness with 50 mg. intramuscularly every four hours for thirty-five days, then 50 mg. every eight hours for ten days; 50 mg. intrathecally once a day for ten days, then every other day for another ten injections. The patient improved steadily until forty days later when her condition again became poor. Treatment was resumed with streptomycin 1 Gm. a day. One week after the tubercle bacillus had not been found in her spinal fluid, the intramuscular injection was discontinued and from that time on the patient received only intrathecal injections of 150 mg. daily or every three days. She was treated a second time for seventy days, receiving an additional total of 13 Gm. of streptomycin. The child has remained well since then. 9 references. 5 figures.—*C. L. Kao.*

(*This is the first published report of its kind from China. Further observation will be required on the case clinically recovered. There are not less than* 100 *cases of tuberculous meningitis in infants and children that have been treated with streptomycin in Shanghai; all died but* 3. *Of those* 3, 1 *became seriously crippled;* 1 *died from recurrent tuberculous meningitis after being well and healthy for one year;* 1 *has remained healthy for more than twenty months, attending a school for deaf-mutes.*—C.L.K.)

15. Liver, Kidneys, Spleen

Lipoid Nephrosis. Clinical and Biochemical Studies of 40 Children with 10 Necropsies. *Walter M. Block, Robert L. Jackson, Genevieve Stearns and Miriam P. Butsch, College of Medicine, State University of Iowa, Cedar Rapids and Iowa City, Ia.* Pediatrics 1:733-53, June 1948.

Forty children with lipoid nephrosis, varying in age from 15 months to 15 years, were observed over a fifteen year period. Criteria for the diagnosis of lipoid nephrosis were edema, proteinuria, elevated blood fats and low protein with decreased albumin, absence of hypertension, of persistent azotemia and of hematuria and normal renal concentrating ability. Fourteen of the children were 6 years of age or older at the time of the illness. Total duration of disease was less than six months for 17 children, ten to thirty months for 13 children and more than four years for 15 children. Twenty-six of the forty children are alive, 19 have been entirely well for less than one year and 4 still have active disease. Of 22 children who had the disease since sulfonamides became available, only 3 have died. The nutritional history had

no relationship to the onset of nephrosis; it was satisfactory in most cases. Upper respiratory infections often preceded the onset. Sinusitis, frequently due to hemolytic Staphylococcus aureus, was a common complication. Enlargement of the liver was repeatedly observed in the absence of cardiac failure. Nine children showed allergic manifestations: urticaria, food allergy, asthma, unexplained eosinophilia; no eczema was noted. Laboratory examination revealed that most of the increase in blood fats was in the cholesterol fraction. Plasma proteins were usually low and showed decrease in the albumin and increase in the globulin fraction with increased fibrinogen. No critical edema level for plasma albumin or total protein was noted. This data was confirmed by electrophoretic analyses in some cases. Prothrombin times were not significantly altered. Blood calcium values were generally decreased. Frequently diuresis occurred when plasma albumin levels were low and cholesterol values high. During the recovery phase albumin values tended to rise and cholesterol values tended to fall, the latter change usually requiring more time. Fluctuations in blood nonprotein nitrogen were common. Transient elevations occurred due to variations in fluid and protein intake and urine output and to intercurrent infections. The sedimentation rate was usually increased as long as the disease was active; it became normal with recovery.

Of the fatal cases, 2 children were observed with arterial thromboses involving the abdominal aorta and the pulmonary artery. No atheromatous changes were seen in these cases. Bacteremia and the pressure of edema fluid as well as the high level of blood fibrinogen were considered contributory factors to thrombosis. Marked fatty infiltration of the liver was not seen in these cases and only those patients who received acacia therapy showed slight hepatic damage. Bone marrow examinations were normal. Involvement of the glomeruli of the kidney was variable. No correlation was noted between the extent of glomerular damage at postmortem examination and the presence or absence of microscopic hematuria in life. In some instances glomerular changes progressed sufficiently to give the picture of chronic nephritis. The clinical course of chronic nephritis with azotemia, hypertension, chronic acidosis and retardation of growth and development was not seen in the nephrotic child who eventually showed nitrogen retention and histologic lesions of chronic nephritis. Since nephrosis may terminate fatally as chronic nephritis, prognosis in the early stages of the disease remains uncertain. Various therapeutic methods are discussed. Vitamin preparations were not of specific value. Diuretics may have given symptomatic relief. Concentrated salt-free albumin seemed an effective diuretic. Intravenous injection of hypertonic sucrose produced diuresis at times, not infrequently followed by recurrence of edema. Such injections must be given cautiously to avert acute circulatory collapse. Acacia therapy can cause liver damage and suppression of blood protein formation. Choline orally failed to alter the clinical course and had no effect on the level of blood fat or hepatomegaly. Bile salts

orally also failed to lower the blood cholesterol. Striking remissions, at times permanent, followed intercurrent infections, particularly measles, but in many illnesses improvement did not occur or proved to be temporary. Infections should be prevented when possible and treated energetically. 28 references. 9 tables. 3 charts.—*H. M. Goldstein.*

(*This wide experience with nephrosis adds important information to our understanding of the clinical disease. The beneficial action of the newer antibacterial agents has greatly improved the prognosis of the disease. The cause for the gradual development of chronic glomerulonephritis in these patients remains unexplained. The high incidence of allergic manifestations seen in this group of patients is in keeping with similar findings in other groups and has led many to the presumption that there may be an allergic element in the causation of this disease. Thrombosis of some of the larger veins has also been noted in some patients. There have been reports of the nephrotic syndrome developing secondary to renal vein thrombosis. We have seen thrombosis of the inferior vena cava. This paper should be read in full to appreciate all the interesting data compiled from these patients.*—ED.)

Endogenous Creatinine Clearance in Infancy and Early Childhood. *Julius Surányi and Stephan Zimanyi, Municipal Institute for the Protection of Mother and Child, Budapest, Hungary.* Lancet 1:653, Apr. 24, 1948.

Endogenous creatinine renal clearance studies were performed on 48 normal children and 32 children with malnutrition, varying in age from 1 month to 5 years. Absolute clearance values were found to increase with age but variations in the first 4 years of life, when corrected for surface area, were found to be insignificant. Children with malnutrition showed a marked decrease in creatinine clearance per square meter body surface. There was also indication of immaturity of renal function during early life. For the normal children studied the following empirical formula was deduced: C.S.=2.2 W+10.1, where C.S.=endogenous creatinine clearance per square meter body surface and W=weight in kilograms. 7 references.—*H. M. Goldstein.*

16. Metabolic and Systemic Disorders

Treatment of Diabetic Coma. *Handbook of Medical Emergencies,* published by the Department of Pediatrics, New York Post-Graduate Medical School and Hospital, New York, N. Y. pp. 21-23, 1948. (*See* PEDIATRIC BOOKSHELF, p. 194)

Treatment of diabetic coma is aimed at correcting the disturbed carbohydrate metabolism as rapidly as possible. The interplay of several factors makes it impossible to predict with any degree of exactness

the amounts of insulin, water, glucose and alkali that will be required to overcome ketosis in any given case. The use of formulas to calculate the requirements for all children in diabetic coma and adjustments may be made for each individual case. This schedule is modeled after that suggested by Hartmann.

TREATMENT OF DIABETIC COMA. (1) *Insulin*:—Two units of regular insulin per kilogram of body weight is to be given subcutaneously at once. A second dose of insulin is to be given six hours later, between 1/4 and 1/2 unit of regular insulin per kilogram of body weight, the exact amount to vary according to the child's needs. (2) *Water and alkali*:—Thirty centimeters M/6 sodium lactate per kilogram of body weight is to be given intravenously in the first six hours. Thirty centimeters M/6 sodium lactate per kilogram and 40 cc. of hypotonic Ringer's solution per kilogram (containing 0.1 mEq. of chloride per cc.) are to be given subcutaneously. If the coma, ketosis and dehydration have not been overcome after six hours, a supplementary injection of M/6 sodium lactate, 30 cc. per kilogram of body weight, should be given. (3) Gastric aspiration should be done to avoid dilatation of the stomach and vomiting. (4) Whenever diabetic coma is associated with infection, specific chemotherapy or antibiotic therapy should be initiated.

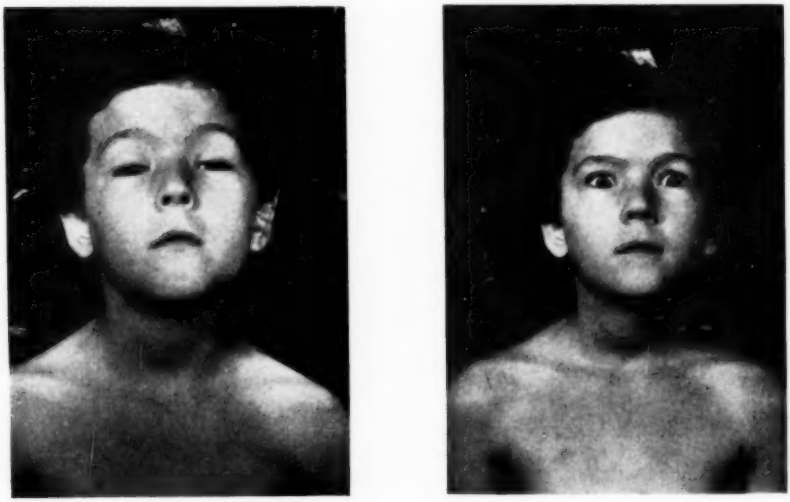
Laboratory tests should be done before beginning treatment and during the course of treatment whenever possible. Before treatment is begun the blood should be examined for its CO_2 combining power or CO_2 content and the concentration of sugar should be determined. Urine should be examined for sugar and ketone bodies (catheterize if necessary). During the course of treatment the urine should be examined for sugar and ketone bodies every two hours until these abnormal substances have disappeared. A second blood sugar determination is advisable after six hours. Failure of the patient to respond promptly to these therapeutic measures should lead the physician to search for an undiscovered infection.

(The mortality from diabetic coma is extremely low in virtually all first class pediatric institutions. Hence, there is little reason for being strongly partisan with relation to the various moot points of the details of treatment which vary from place to place. However, it should be pointed out that there is considerable logic behind the recommendation that glucose solutions be employed along with solutions of electrolytes; they at least minimize the danger of insulin shock supervening suddenly during the treatment of coma. This may happen so rapidly that it can be prevented only by very frequent determinations of blood sugar—an unnecessary precaution if glucose is used. At times an emergency will require that simpler therapy than the one here described be employed if loss of time is to be avoided. It is well to remember that isotonic solution of glucose can be given as a buffer against overdosage of insulin, and that when alkali is needed one can use 4 per cent solution of sodium bicarbonate in place of lactate solution. With such a regimen, glycosuria need not be a matter of concern during the

period of ketosis. Acidosis need not be fully corrected with alkali; the patient usually will need no alkali if his alkali reserve is 30 volumes per cent or more or if he remains free from signs of stupor. Frequent urinalysis must be used as a guide relating to the progressive effectiveness of therapy. The physican should not forget that insulin shock due to the effect of slow-acting insulin may give profound unconsciousness rather than convulsions. Unless the urine being excreted at the time of examination is known to contain sugar, the possibility of insulin shock in the diabetic patient who is unconscious should be disproved before treatment with insulin is undertaken.—ED.)

Myasthenia Gravis in Young Children. Report of Three Cases. One Congenital. *J. Robert Bowman.* Pediatrics 1:472-77, April 1948.

A search of the medical literature revealed reports of 14 cases of myasthenia gravis occurring in children under 10 years of age. During the past three years, 3 children with myasthenia gravis, aged 3, 4 and 8 years, have been treated at the Boston Children's Hospital. These cases are reported because of the rarity of the disease in young children and particularly since myasthenic symptoms and signs were evident in 1 child at birth. This last, a 3 year old boy, was observed to have drooping eyelids and a weak voice at birth. Dysphagia followed a severe attack of bronchopneumonia at the age of 13 months. More or less generalized muscle weakness and increased fatigability gradually developed. This child as well as the other 2 children showed the typical myasthenic response to prostigmine therapy. Fifteen minutes after receiving 0.4 mg. prostigmine methylsulfate intramuscularly all



By courtesy of Pediatrics

the myasthenic symptoms and signs had disappeared. The child has been maintained on 30 mg. prostigmine bromide every three hours orally, and showed remarkable improvement. All children having ptosis of the eyelids should be given the prostigmine test. One of these children had been scheduled for plastic surgical treatment. 6 references. 9 references.—*Author's abstract.*

(*Myasthenia gravis may be congenital and can easily be confused with amyotonia congenita. In any such case the test with prostigmine should be used, which readily differentiates between myasthenia gravis and amyotonia congenita.*—ED.)

Case Report. Progressive Lipodystrophy. Etiologic Aspects and Report of a Case. *Walter W. Iegersheimer, New Haven, Conn.* Am. J. Dis. Child. 75:206-13, February 1948.

Progressive lipodystrophy has been described involving the face, the face and upper extremities, all four extremities, the lower extremities alone and the entire body except the face. Endocrine imbalance, disorders of the autonomic nervous system or of fat metabolism, and damage of the brain due to an infection or toxin have been suggested as etiologic agents. Some reports dealing with hereditary and developmental factors in this disorder are reviewed. A 9 year old boy is described who was studied because of increasing thinness of the face and abdominal pain. At the age of 6 years his face began to assume a drawn appearance unaccompanied by loss of fat from the rest of the body. He continued to gain 3 to 4 pounds a year and remained otherwise healthy. Six months before examination he began to have renal symptoms. On examination the subcutaneous fat of the face appeared absent. Deep creases surrounded the mouth, the cheeks were hollow and the eyes deeply set. The subcutaneous fat depots in all other parts of the body were apparently normal. A pulmonary systolic murmur was heard. Intravenous pyelography and subsequent operation revealed a constriction at the left ureteropelvic junction and a left hydronephrosis caused by aberrant renal vessels. A spina bifida of the fifth lumbar vertebra and partial sacralization of its transverse process were present. The view is presented that this condition is a congenital derangement of the mesenchymal anlage and may become manifest as abnormalities of tissues derived from this germ layer. In the case presented the subcutaneous tissue, the skeletal system and the circulatory system—all of mesenchymal origin—have been implicated. 22 references. 3 figures.

17. Milk; Infant and Child Feeding

The Biological Value of a Meat Hydrolysate in the Infant. *Anthony A. Albanese, L. Emmett Holt, Jr., Virginia I. Davis, Selma E. Snyderman, Marilyn Lein and Emilie M. Smetak, New York University College of Medicine and Bellevue Hospital, New York, N. Y.* J. Nutrition 36:133-38, July 1948.

In a previous paper the authors have reported that enzymatic digests of casein and lactalbumin were equal in nutritional value to a diluted evaporated milk mixture and superior to an acid digest of casein supplemented with tryptophan and cystine. This paper compares the nutritive characteristics of a synthetic milk-like mixture containing an enzymatic digest of beef muscle as the protein component with those of an evaporated milk mixture. The two mixtures employed in this study were given in 5 feedings daily, at the rate of 100 calories and 0.56 Gm. of nitrogen per kilogram of body weight. They were supplemented daily with 50 mg. of ascorbic acid, 15 drops of oleum percomorphum and brewers' yeast. The diets were tested in 5 normal male infants (2.5 to 8 months of age) for four consecutive seven-day periods. In nitrogen retention and body weight gains the evaporated milk and the meat hydrolysate mixtures proved of equal nutritional quality. No significant changes in total plasma protein levels, albumin-globulin ratios or hemoglobin concentrations of the blood were observed. The meat hydrolysate diet furnished more of all the essential amino acids except phenylalanine, isoleucine and leucine. Inasmuch as the two diets were found of equal biologic value, it may be inferred that these amino acid deficits of the meat hydrolysate diet are negligible or are compensated in part by the excess of the other essential amino acids. 5 references. 3 tables.

Infant Nutrition in Rome During and After the War (*Inchiesta sull'alimentazione infantile in Roma durante e dopo la guerra*). *G. Frontali, University of Rome, Rome, Italy.* Pediat. internazionale 1: 1-32, Jan.-Mar., 1948.

In a study of 27,000 newborn infants it was found that the mean birth weight fell from an average of 3,400 to 3,500 Gm. before the war to 2,900 to 3,000 during and after the war. Maternal diets often consisted of 1,000 to 1,500 calories daily with a maximum of 45 Gm. of protein. The average weight gain in the first year of life, which had been 5,222 Gm. previously, fell to 4,870 Gm. This was less marked in suburban areas. Among 3,071 school children aged 6 to 11 years there was a diminution in weight and height from 1.8 to 10.3 per cent in males and 2.0 to 9.3 per cent in females during April 1945 as compared to a similar group in 1940 to 1941 and 1942 to 1943. The diet was previously carbohydrate with little fat and protein. Edema, hypoproteinemia, scurvy, rickets, keratomalacia and tetany were common. Cheilosis, polyneu-

ritis and pellagra were also frequent. Infectious diseases increased in incidence and were severe. Typhoid fever rose and was characterized by a marked delay in development of specific serum agglutinins. Mortality in the first year of life increased from 63 in 1941 to 123 in 1944 per 1,000 live births. With the liberation and UNRRA's assistance this fell to 69 in 1945. It is planned to improve the diet of expectant mothers and of infants, increase the number of specialist medical consultants to some areas, intensify medical supervision of school children and provide special nutritional attention for those requiring such. 25 figures.—*A. M. Bongiovanni.*

(*This survey was conducted by the author with the aid of the National Research Council and has been presented to the International Conference on Maternal and Child Welfare at London in June* 1947 *and the Conference on World Health at Washington, D. C. in July* 1947.—ED.)

Semi-Self-Demand Feeding Schedule for Prematurely Born Infants. *Kurt Glaser, Cook County Children's Hospital, Chicago, Ill.* Am. J. Dis. Child. 75:309-15, March 1948.

A group of 118 prematurely born infants, reared on a semi-self-demand feeding schedule, has been observed at the Cook County Children's Hospital in the outpatient clinic for premature infants. The infants showed progress in growth, as measured by their gain in weight and height, which compared favorably with data reported by other investigators employing different methods of feeding. The method proved convenient for the mothers, to whom it seemed to afford emotional satisfaction. 9 references, 5 tables.

(*It seems surprising that the mothers were not emotionally upset by the return of the premature infant to the home and then by the sudden change from a definite schedule to none. That they were afforded emotional satisfaction by the lack of a schedule appears to be based on impressions as no psychologic studies are reported. The so-called self-demand schedule is logical and very satisfactory during the first few weeks of life for any infant who is vigorous enough to cry when it is hungry. Indeed it is almost obligatory for the overactive infant who likes to eat often and howls until satisfied. Being very active, he needs more food than the placid infant. One does not argue with such an infant or watch the clock. One gives him what he wants, which is food. After a few trying weeks, he will usually place himself on a reasonably regular schedule or can be led into doing so. On the other hand, the occasional infant who sleeps much and does not cry vigorously for feedings, may do poorly on a demand schedule. Such an infant must be wakened on schedule and sometimes even be jogged into taking enough food each time, until he becomes vigorous enough to "demand" his food. Most premature infants are in this category during the first few weeks of life.*—ED.)

18. Miscellaneous

See Contents for Related Articles

19. Musculoskeletal System

The Roentgen Diagnosis of Rickets Associated with Other Skeletal Diseases of Infants and Children. *Ralph S. Bromer and Rolfe M. Harvey, Children's Hospital, Philadelphia, Pa.* Radiology 51:1-10 July 1948.

When rachitic involvement of the skeleton occurs in association with other diseases, the roentgen diagnosis may be difficult but is usually possible. The combinations of rickets with scurvy, infantile syphilis, lead poisoning, erythroblastic anemia and osteogenesis imperfecta are discussed. In most of the cases of rickets combined with scurvy, the signs of scurvy tended to obscure those of rickets unless the rickets were well developed and severe. The type of rarefaction of the cortex may be a useful diagnostic sign. Occasionally groundglass atrophy was observed but in several cases the moth-eaten rachitic appearance predominated. The dense zone of preparatory calcification characteristic of scurvy may not form at all if the rickets are severe. If this zone of preparatory calcification is frayed out and poorly defined, the osteoid zone between the calcified epiphyseal center and the end of the diaphysis may be increased. In all the cases of rickets with scurvy, the ring shadow about the epiphyseal center was seen, indicative of scurvy, even when the zone of preparatory calcification had the rachitic frayed-out appearance. Spreading of the diaphyseal ends may occur in both diseases. The lateral spur of scurvy and rachitic cupping may be differentiated with satisfactory roentgenograms. The periosteal changes of scurvy depend largely on the extent of the hemorrhage, while the periosteal shadows of untreated rickets are usually hazy and only slightly thickened. The rib ends are difficult to demonstrate roentgenologically but, if well seen, the rachitic rosary will show a more frayed-out appearance than the scorbutic rosary. In the few cases observed with simultaneous occurrence of rickets and congenital syphilis, the differentiation of the periosteal involvement by the two conditions was impossible by roentgen examination. Syphilitic osteochondritis was not seen in any of the cases, suggesting perhaps that rickets may obscure the signs of congenital syphilis. Caffey's case report of lead poisoning associated with active rickets is reviewed and another case added. In both, the wide osteoid zone and the zone of preparatory calcification indicated rickets and the characteristic lead line did not appear until treatment had resulted in healing of the rickets. Caffey's report of a case of rickets occurring in a patient with erythroblastic anemia was mentioned. The rickets were demonstrated clinically and roentgenologically. A previously reported case of first rickets and later scurvy

occurring in an infant with osteogenesis imperfecta was reviewed. The assumption is made that the pathologic changes of osteogenesis imperfecta do not interfere with the development or recognition of either rickets or scurvy. 11 references. 7 figures.—*M. Maresh.*

20. Nervous System

Encephalopathies Following Prophylactic Pertussis Vaccine. *Randolph K. Byers and Frederic C. Moll, Boston, Mass.* Pediatrics 1:437-57, April 1948.

This is an analysis of 15 instances in which children developed acute cerebral symptoms within a period of hours after the administration of pertussis vaccine. The explosive reactions began as soon as twenty minutes and as long as seventy-two hours after the inoculations. The outstanding symptom was convulsions, which varied from a few minutes to several days in duration. Changes in consciousness, varying from drowsiness or irritability to deep coma, occurred in all. Milder reactions had occurred following an earlier dose of vaccine in 2 instances; 1 patient was irritable and had a blotchy rash and a second was feverish and lethargic for two days. The children varied between 5 and 18 months in age and had been developing normally according to histories supplied by their parents. None had had convulsions previously. Different lots of vaccine, made by eight different manufacturers over a period of eight years, were implicated. The inoculations were given throughout the usual geographic range of children coming to this hospital. All but 1 of these 15 children later had evidence of impairment of the nervous system. During the same period about half as many children were seen in the same hospital with encephalopathy secondary to smallpox vaccination, and about twice as many with encephalopathy complicating pertussis itself. 36 references. 10 figures. 3 tables.

(*The above report is very disturbing and no information is available as to the cause of such severe reactions. In an Editorial in the same journal* (*Pediatrics* 1:579, *April* 1948) *the following five possibilities are discussed*: "1. *Constitutional peculiarities of the patients themselves.* 2. *Inadvertent intravenous injection of the vaccine.* 3. *Antigen-antibody response to previous specific sensitization.* 4. *The presence of pyrogens in the bacterial bodies or in the water used in the preparation of the vaccine.* 5. *Damage to the cerebral vessels from toxoids of H. pertussis.*" *In the same place, it is suggested that standards should be set up for the manufacture and distribution of pertussis vaccine, preferably by the National Institute of Health.*

Meanwhile, in view of the proved efficiency of pertussis prophylaxis, it seems advisable to continue the routine use of the vaccine for small infants. Although morbidity from pertussis is declining, this decline is due in part at least to the widespread use of immunization.

The authors are able to report 15 patients with encephalpathy but few pediatricians have seen more than 1 or 2 such cases in spite of widespread use of pertussis vaccine. A wise precaution would be to withhold further injections or give much reduced doses with any child who has had a suggestive encephalitis reaction or meningitis-like reaction from a preceding dose of antipertussis material.—ED.)

The Use of Benzedrine and Dexedrine Sulfate in the Treatment of Epilepsy. *Samuel Livingston, Laslo Kajdi and Edward M. Bridge, Johns Hopkins Hospital, Baltimore, Md.* J. Pediat. 32:490-94, May 1948.

Eighty-five epileptic patients, mostly children, were treated with benezdrine sulfate or dexedrine sulfate, and observed for periods varying from two months to five years. Seizures were controlled in 38 per cent and markedly or moderately improved in 20 per cent. The average duration of treatment in the entire group was eighteen months. Seventeen were treated with either benzedrine sulfate or dexedrine sulfate alone, while to 68 the drugs were given in combination with phenobarbital. The daily dosage of benzedrine sulfate varied from 5 to 45 mg. Generally, for the younger children (under 6 years of age) the initial dosage of 2.5 mg. twice daily was increased until satisfactory therapeutic results were obtained. The total daily dose was not permitted to exceed 10 mg. In the older group the daily dose varied from 7.5 to 45 mg. With dexedrine sulfate the daily dosage for the younger children was between 2.5 and 5 mg. and for the older group between 5 and 15 mg. With the larger quantities the medication was administered in three or four doses over the course of the day, the last usually at 4 p.m., never later than 6 p.m. These drugs were more effective in controlling petit mal than grand mal seizures. There was no difference in the results for idiopathic and organic epilepsy. 8 references. 2 tables.

The Electroencephalographic Findings in Measles Encephalitis. *Clemson Marsh, College of Medical Evangelists, Los Angeles, Calif.* Bull. Los Angeles Neurol. Soc. 13:15-18, March 1948.

This is a study of the electroencephalographic changes in 7 cases clinically diagnosed as measles encephalitis. In each instance there was a definite attack of rubeola preceding the onset of the symptoms of encephalitis by one to seven days (average, four days). The neurologic symptoms that led to hospitalization included: generalized and focal convulsive seizures, lethargy, signs of meningeal irritation, hemiplegia and behavior disorders of varying degree. The spinal fluid cell count was above 12 lymphocytes per cubic millimeter in 5 cases. The ages of the patients ranged from 2 to 7 years. There was severe disorganization of the electroencephalographic pattern in all cases studied during the acute stages of the illness. The severe dysrhythmia was attributed chiefly to the diffuse vascular reaction and the associated influence of toxins on the cortical ganglion cells. Most of these disturb-

ances subside without permanent damage. Five of the patients had tracings made during the convalescent period one to five months after the onset of the disease. In 2 of these the dysrhythmia persisted without improvement. Both children gave evidence of extensive cerebral damage with residual neurologic signs and symptoms. In 3 cases there was definite improvement in the appearance of the electroencephalogram. The two to three cycle per second basic frequency found in the acute phase had disappeared and was replaced by six to nine cycle per second frequencies of moderately high potential. These electroencephalographic changes found in the postacute stages were attributed largely to subcortical demyelinization and axonal degeneration, with interruption of the fiber connections between the cerebral cortex and the diencephalon. The focal and lateralizing disturbances in the electroencephalogram tended to correspond to clinical localizing signs. 5 references. 1 figure.

(*This is a useful addition to our knowledge of electroencephalogram tracings. Much remains to be learned both about normal tracings and those in various neurologic conditions.*—ED.)

Subdural Hematoma in Infancy. *Taylor Statten, Hospital for Sick Children and the University of Toronto, Toronto, Ont., Canada.* Canad. M. A. J. 58:63-65, July 1948.

A review of 28 infants with chronic subdural hematoma showed that 4 had had a difficult birth. Five had a history of head injury or fracture and 5 were prematures. Causative or contributory factors for the remainder were not known. Most of the cases were seen within the first 6 months of life, and these were probably caused by birth injury or an injury to the head in the first month or two of life. The older cases arise as a result of head injury after birth. Of the 28 cases all but 2 had bilateral hematomata. The fluid was usually bloody or xanthochromic in color. Blood clots were seldom seen. In 23 of 24 cases typical membranes were found. These membranes usually extended over the whole of the upper surface of the hemispheres. Fractures were present in only 3. Subdural hematoma is often confused with idiopathic hydrocephalus, mental deficiency, intracranial hemorrhage, symptomatic convulsions, hypertonic infant, encephalitis, meningitis, tetany, etc. Many of these conditions carry a very poor prognosis and the parents may be wrongly advised that their child's condition is hopeless. The diagnosis of subdural hematoma is established by puncture of the subdural space and the finding of bloody or xanthochromic fluid.

Symptoms in 28 cases of subdural hematoma were as follows: refusal of feedings—20; convulsions—18; vomiting—16; drowsiness or stupor—15; irritability—13; diarrhea—6; paralysis—4; slow to sit up—3; increased head size—3; bulging fontanel—2. The duration of the symptoms is extremely variable, ranging from many months to only a few days. Affected children seem to fall into three groups. "The first group gives either a history of difficult birth, head injury or pre-

maturity along with a history of failure to thrive. The mildly hydrocephalic infants make up the second group. The increase in head size is usually in the biparietal diameter. The third group is the convulsive and hyperirritable or hypertonic infant that does not respond well to treatment. This type of case is often very acute." Several patients were well until one or more days before admission but operation showed membranes which were several weeks or months old. In these the first symptoms were usually unexplained convulsions, stupor or coma.

Common signs in subdural hematoma are: elevated white blood cells—80 per cent; pallor—80 per cent; retinal hemorrhage (17 out of 21 examined)—80 per cent; bulging fontanel—72 per cent; enlarged head—60 per cent; increased reflexes—50 per cent; xanthochromic spinal fluid—50 per cent; fever—45 per cent; paralysis—28; fractured skull—12 per cent. Bloody spinal fluid should be carefully examined. If allowed to stand or centrifuged, the supernatant fluid will likely be xanthochromic. Treatment is begun by repeated subdural taps to relieve pressure symptoms. There is usually anemia and often an upper respiratory infection which require attention. After seven to ten days, operative burr holes are made. If membranes are present, bone flaps are turned down and membranes removed as completely as possible. This procedure is done in two operations as the hematomata are usually bilateral. The prognosis is good when treated early, skilfully and adequately. Of the author's last 15 surviving cases 10 were developing normally three months to one and one-half years postoperatively; 3 were retarded but these showed signs of gross deterioration before operation. All had been of long standing. 4 references.

21. *Newborn Period, Prematurity*

Infant Mortality in Rome From 1936 to 1944 (*La mortalita infantile in Roma dal* 1936 *al* 1944). *Giuseppe Iacono, University of Rome, Rome, Italy.* Pediat. internazionale 1:209-36, Jan.-Mar. 1948.

An increase in the total population of Rome by 15 per cent is noted during the years of the war. The number of live births fell 5 per cent from an average of 28,727 per annum during the five years preceding the war to 27,417 throughout 1941 to 1944. In terms of births per 1,000 population, a fall from 24.1 in 1938 to 16.3 in 1945 is seen. The latter figure is lower than that for all of Italy (18.3 in 1945) and is attributed to more difficult conditions in a large city during war. In the year 1944, the birth rate of 16.6 per 1,000 population was exceeded by the general mortality rate of 17.1. Infant and childhood mortality rates (up to age 12 years) rose from an average of 123.93 per 1,000 live births during 1936 to 1940 to 148.44 during 1941 to 1944. The most marked increase (21 per cent) was seen in the first year of life and was due to gastrointestinal and respiratory disease. Deaths attributed to congenital causes through the age range 1 to 12 years rose from

28.8 to 34.0 per 1,000 live births during the war. Death due to respiratory disease increased largely because of a shortage of sulfonamide drugs, which had previously been responsible for a marked drop. Typhoid and diphtheria as causes of death in this age group were slightly increased, influenza and pertussis slightly diminished. Tuberculosis was much more frequently incriminated. 9 references. 5 tables.—*A. M. Bongiovanni.*

Control of Air-Borne Infections in a Nursery for Young Infants. *Iwan Rosenstern, Evanston, Ill.* Am. J. Dis. Child. 75:193-202, February 1948.

At The Cradle, an adoption nursery of 36 infants, there was an epidemic of enteritis in 1927 in which 27 deaths occurred out of 80 cases. As a result of this epidemic Dr. Gladys Dick introduced an individual aseptic nursery technic in 1929. Since the introduction of this technic which includes individual cubicles and individual supplies for each infant, there have been no deaths due to enteritis contracted after admission, and no instances of cross infection of other contact diseases like impetigo. However, respiratory infections continued to spread from sick to well infants, the only remaining vector being the air. In order to control airborne infections, the following principles have been applied since 1939: Air conditioning, germicidal lights, mechanical barriers and face masks. The results obtained in various units during a seven year period were as follows: (1) Air conditioning alone did not prevent the spread of respiratory cross infections (7 cases per year). (2) Germicidal irradiation of the upper air and air conditioning reduced the number of respiratory cross infections (2 cases per year). (3) Germicidal light barriers in front of the cubicles and air conditioning were efficient (0.3 cases per year). (4) Mechanical barriers (swinging doors) in front of the cubicles and air conditioning with higher air pressure in cubicle than in corridor were efficient (0.4 cases per year. (5) The gauze-covered flannel filter mask, worn by all attendants, seemed to be of value in preventing transmission of respiratory infections from nurse to infant. 4 references. 4 tables. 5 figures. —*Author's abstract.*

(That ultraviolet irradiation of air by germicidal lamps can cut down enormously the number of bacteria circulating in the air of a room and thereby minimize cross-infections spread by this route, is no longer under dispute. One must recognize, nevertheless, that infectious material exhaled or coughed in droplet form may pass directly from nurse or physician to patient without being made germ free no matter how many ultraviolet lights are burning in the room. The gauze mask is intended to take care of these droplets, of course, yet simple observations of nurseries where these are in use will often reveal that the wearers of the masks are continually handling and adjusting them, and thereby contaminating their hands. Since handling of a mask saturated with exhaled moisture is an excellent way of conveying respira-

tory tract pathogens from the face to the fingers and thence to the patient, the employment of a mask in newborn nurseries is not necessarily a step in the precautionary direction. The wearing of a mask over the mouth alone, without simultaneously covering the nasal orifices, makes for much more comfort for the wearer and less handling of the masks, but permits escape of droplets from the nose. Many excellent nurseries of our acquaintance have ceased the use of the mask in the past few years while maintaining the best of all other technics and have had no rise in the infection rate afterward. The results in the paper abstracted above would be more meaningful if the number of infants in each group were itemized for each year and also the rate of infections for each year.—ED.)

A Study of Neonatal Infections in the Nurseries of a Maternity Hospital. *M. J. L. Frazer, Jubilee Maternity Hospital, Belfast, Ireland.* Arch. Dis. Childhood 23:107-13, June 1948.

Sixty-three, or 2.77 per cent, of 2,274 newborn infants contracted infections in a period of 14 months. Eighty-four per cent of these infections were caused by Staphylococcus aureus and 13 per cent by Monilia albicans. In the remaining 3 per cent the organisms were not stated. In 36 cases the site of infection was the skin. The probable source of infection was the mother in 15.8 per cent of the cases, the nurse in 20.6 per cent, trauma in 6.3 per cent, intrapartum in 7.9 per cent, and unknown in 49.4 per cent. The infection rate was related to season but overcrowding was not a factor. The infection rate was calculated for infants in various types of nursery. The rate was highest when the infants' cots were beside the mothers' beds; lowest when the infants were in separate nurseries. It was concluded that the most important factors in prevention of infection were the maintainance of an efficient barrier nursing technic and the use of the small separate nursery. 11 references. 4 tables. 4 figures.—*A. N. Evans.*

(*There is great need for studies of this sort in the United States.* —ED.)

The Baby as a Problem in Premature Delivery. *N. W. Philpott and F. J. Tweedie, Montreal, Que., Canada.* Am. J. Obst. & Gynec. 55: 481-88, March 1948.

During the period 1941 to 1946, there were 15,691 deliveries at the Royal Victoria Hospital, Montreal, with a fetal mortality rate of 3.6 per cent. During this same period, there were 912 premature deliveries, an incidence of 5.7 per cent. The mortality rate, divided into two three-year periods (1941 to 1943 and 1944 to 1946) was 24.3 per cent and 21.0 per cent, respectively. A separate premature nursery with special facilities was in operation during this latter period. Of 17 infants weighing less than 1,000 Gm. at birth cared for in this nursery, 5 survived. The smallest with a birth weight of 660 Gm. is now over

2 years of age. A discussion is given of the obstetric problems involved in the management of premature labor and the premature infant.

22. Nutrition

Plasma Levels of Vitamin C Among School Children in Paris, 1947 (*La vitamine C du plasma sanguin chez des écoliers parisiens en* 1947). *Hugues Gounelle, Serge Bonfils and Christiane Marnay, Foch Hospital, Paris, France.* Bull. Acad. nat. méd. 131:396-97, Dec. 9 & 16, 1947.

In 22 per cent of 295 children the plasma level could not be measured satisfactorily; in 77 per cent the level was below 0.4 mg. per cent. Any level below 0.8 to 1.2 mg. per cent is considered subnormal. It was concluded that at that time of the year (early spring) vitamin C deficiency was widespread among school children in Paris, although there were no clinical manifestations of deficiency. The study was repeated in June 1947. At that time only 50 per cent of this student group showed levels below the accepted normal. Fifty-six per cent of the children from needy families had hypovitaminosis; it was found only in 24 per cent of the children living in more favorable economic circumstances. The age distribution of children ranged from 6 to 14 years without any definite differences being noted between the younger and the older individuals. The vitamin deficiency was not improved significantly by administration of crystalline ascorbic acid (300 mg. three times weekly for three months) since 32.7 per cent of the children still exhibited subnormal levels. There was no significant capillary fragility associated with hypovitaminosis.

Nutritional Status of Children. III. Blood Serum Vitamin C. *E. Z. Moyer, A. P. Harrison, Marjorie Lesher and O. Neal Miller., Children's Fund of Michigan, Detroit, Mich.* J. Am. Dietet. A. 24:199-204, March 1948.

Vitamin C was determined in the serum from fasting blood samples from 384 boys and girls in the care of five Michigan institutions and health camps. The mean values for the different groups ranged from 0.68 to 1.42 mg. per 100 cc. The frequency of levels below 0.6 mg. ranged from 5 to 28 per cent in the fall and from 14 to 47 per cent in the spring. Correlations of the values for vitamin C in the serum with the levels of vitamin A, carotenoids, hemoglobin or serum alkaline phosphatase did not show significant relationships, nor did sex, age or weight of the subjects appear to be related to vitamin C concentration in serum. The values for the children attending a health camp increased considerably during a six weeks period. Analysis of weighted composites representing the food eaten by four children indicated that a daily intake of approximately 60 mg. of vitamin C was consistent with a fasting serum concentration of 0.7 mg. or more per 100 cc. 42 references. 5 tables.

Nutritional Status of Children. IV. Nutritional Conditioning in a Health Camp. *Moses Cooperstock, Elba Morse, Elsie Z. Moyer and Icie G. Macy, Northern Michigan Children's Clinic and Children's Fund of Michigan, Detroit, Mich.* J. Am. Dietet. A. 24:205-11, March 1948.

Determinations of body weight and fasting blood serum vitamin C and pediatric examinations provided data with which to assess the nutritional conditioning of 57 boys and 42 girls, 6 to 15 years old, during six weeks in a health camp. The camp provided recreation, an excellent diet and a healthful environment. Medical examinations on arrival showed each child to have some oral abnormality or infection such as dental caries, excessive dental repair, gum hypertrophy, gingivitis or malocclusion; and 62 exhibited evidence of inferior nutritional status classified as: undernutrition; pallor; granulation of eyelids; smooth tongue; follicular conjunctivitis; or rough, dry skin. Ninety-three of 99 children increased their body weights by 0.1 to 25.1 per cent during the six weeks, making average weekly gains of 5 to 1,191 Gm. The initial levels of fasting blood serum vitamin C showed that the majority of the children (59 of 88) had less than 0.8 mg. of vitamin C per 100 cc. the values for 27 being within the scurvy level (0.0 to 0.5 mg.) and values for 32 indicating a prescorbutic state (0.5 to 0.8 mg.) After three to four weeks at camp, determinations for 61 children showed none with a serum vitamin C value below 0.4 mg; 51 had values of 1.0 mg. or more; 5 from 0.8 to 1.0 mg.; and only 5 were below 0.8 mg. Determinations during the final two weeks of camp showed 64 children to have levels of blood serum vitamin C at or above 1.0 mg.; 2 with levels of 0.8 and 0.9 mg.; and 3 with 0.4 to 0.6 mg. These data are said to demonstrate the readiness of children to achieve levels of serum vitamin C of 1.5 to 2.3 mg. per 100 cc. within a short time in response to proper environment and unsupplemented diets composed of common foods. 6 references. 4 tables. 2 figures.

(*Without in any way belittling the benefits of six weeks in a health camp, one may yet seriously question several of the implications contained here concerning so-called nutritional conditioning. The relation between the clinical evaluation of health or nutritional status and the initial vitamin C level is not clear cut. One girl, for example, with a poor nutritional status showed over 2.0 mg. per 100 cc. of serum as her initial vitamin C level. The medical examinations give inadequate evidence as to either the initial status or the degree of improvement. For example, the inclusion of the item malocclusion as a significant oral abnormality is entirely irrelevant to such a study. The reported increases in serum vitamin C levels in such a group of underprivileged children during the six weeks of camp are to be expected. Although this was naturally gratifying it is certainly open to question whether one is justified in labeling this nutritional conditioning. The implication that the nutritional state in general has been put in proper condition seems unwarranted. Numerous studies have demonstrated that*

the plasma ascorbic acid level can be maintained around 1 mg. per 100 ml. or above by large daily intakes.

Almost 200 years ago it was showed that lime juice could prevent the development of scurvy among ship's crews. On long voyages the amount of fruit or juice which each man received was necessarily limited. For adults, intakes of around 25 mg. per day have been sufficient to prevent scurvy and to maintain a constant low plasma level over long periods. (Pijoan & Lozner: Bull. Johns Hopkins Hosp. 75:303, Nov. 1944; Najjar et al.: Ibid. p. 315; Pijoan & Lozner: New England J. Med. 231:14, July 6, 1944). This latter finding suggests that such subjects have been in ascorbic acid balance. In one study however, (Linghorne et al.: Canad. M.A.J. 54:106, Feb. 1946) subjects on 25 mg. per day maintained an average plasma level of about 0.2 mg. per 100 ml. but their average white cell-platelet content of 13.2 mg. was below the usual "normal" content of 25 mg. per 100 ml. Beyond the advisability of supplying some excess as a safety measure, there is little other evidence to suggest that the average adult requires more than 25 mg. of ascorbic acid per day. Indeed, young adults can remain in apparent good health for long periods on intakes too low to maintain any detectable plasma level, provided the tissue content (as determined in the white cell-platelet layer of the blood) remains satisfactory. Daily intake of 50 to 75 mg., as usually recommended are intended to supply a safe excess and to allow for temporary increases in demand due to infection or other causes. Infants with acute scurvy may heal their lesions satisfactorily on ascorbic acid intakes too small to raise the plasma level above 0.2 mg. (Mindlin, R. L.: J. Pediat. 17:621, 1940) The terms normal (above 0.6 or 0.8 mg. per 100 ml. plasma), prescorbutic (down to 0.5 or 0.2 mg.) and scorbutic levels (0 to 0.2 or 0.5 mg.) are meaningless and should be abandoned. The patient with frank scurvy will always have zero level before treatment.

The premature infant may be an exception to the above statements. Such infants seem to require large intakes of ascorbic acid in order to metabolize tyrosine and phenylalanine. Probably chronic infections increase the daily requirement but this has not been fully demonstrated. The growing child probably needs proportionately more than the more stabilized adult. Furthermore, the rapidly growing teeth and periodontal tissues of infants will show scorbutic changes more readily than the less active adult tissues. Fifty milligrams of ascorbic acid per day, preferably as food, should provide an adequate excess in the absence of chronic infection. It should be added that ascorbic acid is readily absorbed and harmless, and any excess is easily excreted in the urine. Until the body is saturated, nearly all that is fed is retained.—ED.)

Nutritional Status of Children. V. Blood Serum Protein. *Eliot F. Beach, Ann P. Harrison, Marjorie Lesher, Mildred Kaucher, Charlotte Roderuck, Wanda Lameck and Elsie Z. Moyer, Research Laboratory, Children's Fund of Michigan, Detroit, Mich.* J. Am. Dietet. A. 24:405-409, May 1948.

Serum protein was determined in fasting blood samples from 390 children, 2 to 18 years old, in the care of five Michigan institutions and agencies. One hundred and fifty-five of the children were studied twice, once in the fall and again in the spring. No significant differences were found between mean values for males and females, those for white and Negro boys, nor between determinations made near the beginning and end of six weeks in a health camp. There was no consistent relationship with age. The mean of all fasting blood serum protein values was 7.0 Gm. per 100 cc. and all but 5 of the subjects showed levels between 6.0 and 8.6 Gm. per 100 cc. 26 references. 4 tables.

Nutritional Status of Children. VI. Blood Serum and Vitamin A and Carotenoids. *Abner Robinson, Marjorie Lesher, Ann P. Harrison, Elsie Z. Moyer, Mary Catherine Gresock and Claribel Saunders, Children's Research Fund of Michigan, Detroit, Mich.* J. Am. Dietet. A. 24:410-16, May 1948.

The levels of vitamin A and carotenoid pigments were determined in fasting blood serum of 358 children, 2 to 8 years old, in the care of five Michigan child-caring agencies, using the Bessey and Lowry microchemical technics. It is pointed out that at present, tables of analytic values for common foods give only the total vitamin A potencies but provide no information concerning the portions derived from carotene, or, usually, the method by which alpha-carotene and beta-carotene were calculated. Agreement has not been obtained on a reliable factor for converting micrograms of vitamin A and carotene determined by spectrochemical methods to International Units of vitamin A. Data were obtained showing the variability between analyses of duplicate samples, of fasting serum samples taken from the same subject on consecutive days and of samples taken in the fall and spring. The various groups of children differed markedly in level of blood carotenoids, suggesting differences in dietary patterns. For groups tested in the fall the mean values of serum vitamin A ranged from 31 to 42 micrograms per 100 cc.; for groups tested in the spring, from 30 to 42 micrograms. In the fall the serum carotenoids in these groups ranged from 100 to 185 micrograms per 100 cc.; in the spring, from 99 to 146 micrograms. Thus the autumn values for carotenoids were higher than the spring values. Rises in levels of serum carotenoids and vitamin A were found in response to favorable circumstances and ample supplies of fresh green and yellow vegetables provided during a six week camping experience. 39 references. 5 tables. 2 figures.

23. Parasitic Diseases

Diagnosis and Treatment of Scabies. *Eugene A. Hand, Saginaw and Bay City, Mich.* J. Mich. State M. Soc. 47:519-22, May 1948.

In all cases of suspected scabies search should be made for the causative mite, Sarcoptes scabiei. With lesions on the webs of the fingers, the fingers or the wrists, a sterile sharp razor blade is used to shave off a very thin slice of a vesicle, pustule or burrow. With lesions on the abdomen, genitalia, buttocks or other parts less easily reached, the lesion is scraped with a razor or a sterile detachable knife blade. The material obtained is transferred to a glass slide, dissolved in 10 to 20 per cent sodium or potassium hydroxide, covered with a cover slip and examined microscopically. In children, especially infants, the scalp and face may be involved. Scabies should be suspected in all children with furunculosis, ecthyma, pyodermia, or impetigo. The following areas should always be examined: webs of the fingers, anterior wrists, elbows, anterior axillary folds, nipples and breasts in women, navel and abdomen, penis, scrotum, buttocks, knees, ankles and toes. Scabies may be found in all classes and in all age periods. It is usually spread by intimate contact, such as sleeping with an infested individual. Frequent bathing is an important prophylactic measure. One should find and treat all infested contacts and give prophylactic treatment to those who have had intimate contact with the patient. The object of treatment is the killing of all adult mites, larvae and ova. Children, particularly infants, often exhibit dermatitis as the result of the medications. Itching after treatment may indicate failure in cure but is more likely to result from sensitivity to the dead parasites. "More chronic skin disease in later life can be traced to injudicious or overtreatment of scabies in babyhood and childhood, than to any other cause." Sulfur in ointment form, especially when incorporated in the newer vanishing cream bases, is highly effective but unfortunately is messy and often produces dermatitis and pyodermia. A 3 per cent sulfur ointment for infants (3 to 8 per cent ointment for children) can be used. The ointment should be applied over all the body below the neck twice daily for three to five days. The patient should not bathe during the treatment. "A suggested schedule of treatment very effective in my hands, in military and civilian practice, has been the use of 20 per cent benzyl benzoate in calamine lotion, or preferably liniment, applied over the body from the neck down twice daily for three to five days. It is important to follow the case, so that overtreatment will be avoided. After this course, patients are instructed to avoid soap, to take daily baths, and use nonirritating topical applications for several weeks. . . . In babies and the fair-skinned, 5 to 10 per cent benzyl benzoate is advocated in place of the stronger preparation." 10 references, 6 figures.

(*In ordinary practice one rarely looks for the parasite. Search*

for it is essentially a teaching procedure, though occasionally conducted in the usual case in which it is important to establish the diagnosis unequivocally. As a matter of fact, most of the time a therapeutic trial with benzyl benzoate is more accurate than scraping of the skin. An excellent study on scabies was carried out during the war by Kenneth Mellanby (Scabies, Oxford University Press, London, 1943) and this should be on the must list for all students of the subject. One interesting point made by Mellanby is that the prominent size of the individual lesions is due in large measure to an allergic response on the part of the sensitized skin. With respect to therapy, 2 or 3 applications of benzyl benzoate are usually enough to clear the skin of a child with scabies. The six to ten applications advised by the author for adults can irritate the skin of a child.—ED.)

24. Pathology, Anatomy, Bacteriology

See Contents for Related Articles

25. Physiology, Biochemistry

The Effect of Oral Administration of Casein Hydrolysate on the Total Circulatory Plasma Proteins of Man. *Bacon F. Chow and Shirley De Biase, New Brunswick, N. J.* J. Lab. & Clin. Med. 33:453-61, April 1948.

Twenty-eight patients with hypoproteinemia due to various causes were given oral casein hydrolysate. Regeneration of both plasma globulin and albumin was promoted. In 6 cases of severe hypoalbuminemia the albumin level was corrected rapidly. Five hypoalbuminemic patients in the terminal stage of their disease did not regenerate plasma proteins. Hydrolysate was fed at a nitrogen intake of 0.6 to 1.0 Gm. and enough dextrimaltose was given to assure a daily intake of at least 3,000 calories. 18 references. 6 tables.

The Chemical Specificity of the Interaction of Diverse Human Plasma Proteins. *Edwin J. Cohn, Harvard Medical School, Boston, Mass.* Blood 3:471-85, May 1948.

The author describes the multivariable approach to the chemical study of plasma proteins. Insofar as this system of fractionation is successful, each protein component responsible for a specific chemical reaction and physiologic function is separated from those of different properties, and concentrated. One fraction should be positive with respect to any test to which the whole plasma is positive; all others should be negative. Application of various chemical methods has revealed that the number of the plasma proteins is far greater than can be detected electrophoretically or in the ultracentrifuge. At least

thirty-eight different fractions are described and their demonstration illustrated. The list includes at least four β_1-globulins and at least two α_1- and three α_2-globulins; also fibrinogen, antihemophilic globulin, isoagglutinins, two complement components, two enzyme precursors (prothrombin and plasminogen), seven serum enzymes (thrombin, amylase, lipase, esterase, etc.), iodoprotein, thyrotrophic hormone, two glycoproteins, two lipoproteins, bilirubin-containing α_1-globulin, and two forms of albumin. 66 references. 1 table. 1 figure.

The Permeability of The Human Placenta to Sodium in Normal and Abnormal Pregnancies and the Supply of Sodium to the Human Fetus as Determined with Radioactive Sodium. *L. B. Flexner, D. B. Cowie, L. M. Hellman, W. S. Wilde and G. J. Vosburgh, Carnegie Institution of Washington, Baltimore, Md. and Washington, D. C. and Johns Hopkins University and Hospital, Baltimore, Md.* Am. J. Obst. & Gynec. 55:469-80, March 1948.

Observations were made upon 27 women in whom pregnancy was terminated by abdominal hysterotomy, in order to determine the rate of placental permeability of sodium. Minute tracer quantities of radioactive sodium were injected intravenously approximately thirty minutes before delivery of the fetus. Nonviable fetuses were ashed for sodium determinations. Volume of extracellular fluid in the fetus was found to average 43.5 per cent of body weight by previous studies utilizing radioactive sodium. The experimental results revealed, in general a seventyfold increase in placental permeability of sodium from the ninth to thirty-sixth weeks of gestation. From the thirty-sixth week to term placental permeability rapidly decreased. The safety factor for sodium represents the ratio of fetal acquisition from the maternal plasma to fetal retention for growth. The factor was 160 at twelve weeks and 1,130 at forty weeks of gestation. Thus, at forty weeks gestation, 1 part of sodium transferred across the placenta is retained by the fetus for growth and 1,129 parts are returned to maternal plasma. The change in placental transfer after the ninth week of gestation to term can be correlated with concurrent histologic changes in the placenta. 11 references. 2 tables. 3 figures.

Blood and Extracellular Fluid Studies in Chronic Malnutrition in Infancy. *Frank Gollan, U.S.P.H.S. and University of Minnesota Medical School, Minneapolis, Minn.* J. Clin. Investigation 27:352-63, May 1948.

The poor results obtained with intravenous therapy in dehydrated and emaciated Italian children during the recent postwar period stimulated this study. A total of fifty-five observations were made on 23 cases of severe marasmus in infancy and 6 cases of chronic malnutrition in older children. Of these 23 children 13 were selected as having comparable age and clinical pathologic conditions. On comparing these 13 patients with normal infants of the same age, there was a loss of 53.9 per cent of actual weight, 44.8 per cent of calculated weight, 18.1

per cent of height and 38 per cent of body surface. In speed and direction of development, the marasmic infants of an average age of 6 months showed a retardation of 5½ months as measured by the Wetzel Grid method. The total circulating hemoglobin showed a reduction as did the hematocrit and hemoglobin concentration. Blood nonprotein nitrogen levels were within normal limits and plasma sodium and chloride levels were slightly reduced. The determinations of plasma volume and extracellular fluid were made simultaneously. The dye T-1824 was used in the determination of plasma volume and sodium thiocyanate for the determination of extracellular fluid. In these studies it was noticed that the rate of disappearance of the dye T-1824 from the blood stream was increased. While the absolute values of plasma did not change significantly, the absolute values of extracellular fluid were reduced. When the absolute value of plasma volume was related to body length and surface, it was in excess of normal. If extracellular fluid was related to body length and surface, there was a reduction in the values obtained. A low albumin-globulin ratio was present due to a reduction in the concentration of albumin and an increase in the concentration of globulin. The albumin-globulin ratios in eight marasmic infants ranged from 1.40 to 2.15 with an average of 1.64. Edema was not a feature in the infants studied. If it became necessary to administer intravenous fluid, the children developed edema very rapidly. The latter fact is correlated with the increased disappearance of the dye T-1824 by the suggestion that an increase in capillary permeability may be responsible for both. Failure of absorption from the gastrointestinal tract is said to be the essential lesion in the irreversible stages of starvation. 46 references. 9 tables. 4 figures.—*Author's abstract.*

(*It must be kept in mind that the dye method determines plasma volume plus an uncertain and variable quantity owing to leakage of the dye into the lymphatic system. The thiocyanate method also gives false and variable results owing to concentration of thiocyanate in fluids other than extracellular fluids. The data can probably be accepted as showing general trends.*—ED.)

Convalescence. A Study in the Physiological Recovery of Nitrogen and Liver Function. *R. W. Keeton, W. H. Cole, N. Calloway, N. Glickman. H. H. Mitchell, J. Dymiewicz and D. Howes, University of Illinois, Chicago and Urbana, Ill.* Ann. Int. Med. 28:521-51, March 1948.

The present discussion deals largely with the convalescence of patients submitted to herniorrhaphy and is confined to the recovery of nitrogen metabolism and liver function. The nitrogen excretion on the day of operation and on five succeeding days was found to be the same under inhalation anesthetic (nitrous oxide and ether) as under a spinal anesthetic. Patients who received orally postoperatively a diet containing submaintenance amounts of calories and protein showed a maximal negative nitrogen balance on the day of operation. With an

increase in diet there was a progressive return to a positive balance by the fifth day or shortly thereafter. Patients who received by tube a diet containing basal calories plus 20 per cent to basal plus 100 per cent and 1.2 to 2.7 Gm. of protein per kilogram of body weight retained nitrogen on the day of operation but developed a negative balance on the first or second postoperative day. Return to a positive balance was facilitated by an increase in calories from protein. This wastage of nitrogen which occurred on the day of operation and the first and second postoperative days was seen in subjects to whom generous supplies of protein were given. A positive nitrogen balance for a period covered by the day of surgery and five succeeding days was maintained by regimens which furnished either excessive or maintenance calories combined with excessive quantities of protein (2.7 Gm. per kilogram of body weight). This positive balance was augmented by ambulation. A negative nitrogen balance over the same period developed when the subjects received maintenance calories and 1.2 Gm. of protein per kilogram or less. Wastage of nitrogen followed promptly the onset of infection and persisted until the infection was controlled. The efficiency of the liver as measured by the urinary urobilinogen excretion showed a maximal drop on the third postoperative day with a return to normal by the sixth day. The efficiency was maintained by diets high in protein (2.7 Gm. per kilogram of body weight) combined with either maintenance or excessive calories. There appears to be a critical level of protein required in the diet to protect the liver efficiency. It lies somewhere between 1.2 and 2.7 Gm. per kilogram. The maintenance of liver efficiency was not facilitated by ambulation. The efficiency deteriorated with the onset of infection. The efficiency of the liver as measured by bromsulfalein excretion was maximally depressed on the day of operation. It returned to normal by the sixth or later postoperative day. Depression of liver function by infection was evidenced by this test also. 44 references. 11 tables. 10 figures. —*Author's abstract.*

26. *Psychology, Psychiatry*

Encephalitis as a Causative Factor in Behavior Disorders of Children. An Analysis of Seventy-Eight Cases. *J. Victor Greenbaum and Louis A. Lurie, Cincinnati, O.* J.A.M.A. 136:923-30, Apr. 3, 1948.

Observations are reported on 78 children with personality difficulties and behavior disorders ascribed to a previous attack of illness. There were 61 boys and 17 girls. The antecedent illnesses were listed as follows: "I. Virus type:" polioencephalitis, 5; lethargic encephalitis, 7; influenza encephalitis, 7; measles encephalitis, 8; chickenpox encephalitis, 1; virus encephalitis of unknown origin, 9; total 37. "II. Toxic type:" diphtheritic encephalitis, 2; scarlet fever encephalitis, 2; pneumonia encephalitis, 4; whooping cough encephalitis, 15; meningo-

encephalitis, 1; other toxic conditions of unknown origin, 5; total 29. "III Traumatic type:" total, 12. The age of onset was in the first decade of life in 60, and before the age of five years in 43. As a rule the behavior difficulty or personality change was noted immediately after the illness. The abnormal patterns which these children exhibited were usually multiple and have been divided into three groups: (1) simple behavior disturbances; (2) psychopathic behavior; (3) psychotic behavior.

When the children were first studied, 14 were found to be feebleminded, 7 rated borderline and 57 were of average or superior intelligence. Forty-seven were retested several years later; the IQ's were the same in 9, improved in 1 and deteriorated in 37. Neurologic abnormalities were noted in all but 22 and were of both the pyramidal and the extrapyramidal types. Ocular symptoms were present in 16. Three had petit mal attacks and 6 suffered from grand mal seizures. Seven showed symptoms of parkinsonism. Electroencephalograms of 15 showed 8 to be abnormal. Sixty-one (80 per cent) had lack of inhibition, restlessness, impulsiveness, extreme distractibility and unpredictibility of behavior. Only 12 have made a fair social adjustment despite medical, psychiatric and social therapy in the majority of cases. The failure of therapy indicates that the problems of the child presenting postencephalitic behavior disorders or personality changes are primarily the results of the neuropathologic changes. 5 references. 1 chart. 4 figures.

(*Of the 3 cases cited in detail, only one seems to have had recognizable encephalitis. One had had antecedent measles [simply called severe] and the third had had chronic otitis media. Diphtheritic encephalitis (2 cases) is an unfamiliar entity. Lethargic encephalitis presumably refers to the 1918 to 1928 epidemic; traumatic encephalitis ought to have its criteria given. The 3 cited children came from disturbed and unhappy family backgrounds which were not caused by the alleged precipitating illnesses. Children with behavior difficulties following encephalitis are familiar to all pediatricians. Fortunately, only a small percentage of virus and bacterial infections are followed by this syndrome. Whooping cough with cerebral involvement can leave in its wake the same sort of behavior, presumably as a consequence of the diffuse petechial hemorrhages which may occur throughout the brain. Many other illnesses can also cause diffuse brain damage which may afterwards become reflected as behavior disorders. We are not convinced, however, for the reasons given, that a preceding encephalitis should be strongly suspected "when confronted with a child who is extremely hyperactive, restless and destructive, has a short attention span, is highly distractible, lacks self control and whose actions are extremely unpredictable." Furthermore, it is not justified to conclude that social therapy or psychotherapy failed in these cases without describing and evaluating what such therapy consisted of and what standards were set for the therapeutic goals. Psychotherapists have different*

goals; none claims ability to make over completely or transform entirely any personality structure. For the most part they are content with degrees of beneficial change. Psychotherapeutic cure differs in this respect from cures effected in physical therapy.—ED.)

A Biochemical Consideration of Mental Deficiency. The Role of Glutamic Acid. *Heinrich Waelsch, New York State Psychiatric Institute.* Am. J. Ment. Deficiency 52:305-13, April 1948.

Any study of the effects of glutamic acid is different from the common problems of nutrition which deal mainly with indispensable food components because: (1) glutamic acid is a dispensable amino acid which is apparently synthesized in considerable amount by the mammalian organism; (2) it exerts its clinical effects if added in relatively small amounts to a complete and satisfactory diet. According to reports by neurologists having an extended experience with glutamic acid it appears that 1 out of 3 or 4 patients suffering from petit mal epilepsy is benefited by taking 9 to 12 Gm. of this substance daily. Glutamic acid rarely eliminates the seizures completely but seems to decrease the number of seizures below the previous level. When the effect of glutamic acid was tested in mentally retarded subjects without any history of convulsive disorder, a rise of mental age corresponding to an increase of IQ from 5 to 17 points was found in nearly every one. If placebo administration was instituted after the glutamic acid period the patients started to regress to the original level, and improved again when glutamic acid was administered. Glutamic acid accelerates the maze learning ability of white rat and causes them to advance further in a series of increasingly difficult problems which may be taken as tests of the intelligence level. In these animal experiments the rats were normal healthy animals receiving a basic diet which would guarantee normal development. This demonstration that a dispensable food and body constituent has positive effect upon the working performance of the brain appears to be of considerable theoretic significance. It is not known whether the added glutamic acid ever reaches the brain or whether it is metabolized by some other organ with an indirect effect on the brain. The question arises whether the same effect would be obtained when the same amount of glutamic acid is supplied as part of a protein rather than in the free state. It is conceivable that the glutamic acid is correcting a mild and otherwise undetectable nutritional deficiency which is more observable in the central nervous system than in any other organ.

Patients who, before administration of glutamic acid, appeared to be dull, inattentive and easily fatigued become more alert, attentive and persistent in trying to accomplish the tasks put before them. Glutamic acid apparently does not increase the actual intelligence of the human subject or the animal but facilitates, instead, the utilization of inherent or potential capacities with greater efficiency by some such mechanism as removal of an inhibition. It may be visualized that a

biochemical mechanism already going on becomes speeded up by the addition of one of the reaction components—in this case, glutamic acid. Determinations of fasting levels showed the values for free glutamic acid and glutamine to vary considerably in the same individual over a period of time under apparently constant environmental conditions. Such variations make the comparison and evaluation of single values in normal individuals and in patients impossible. There is relatively little free glutamic acid in human plasma (0.5 to 1.3 mg. per 100 ml.) and this may be the reason for the effect of added amounts of the free amino acid, provided that comparably low concentrations also occur in tissues. The amide of glutamic acid, glutamine, is present in much larger concentration (5 to 12 mg. per 100 ml. of plasma). This suggests that the circulating form of glutamic acid is the gamma-substituted amide glutamine and the gamma-substituted peptide glutathione.

Since glutamic acid can be synthesized in considerable amounts in the body, experiments designed to interfere with the utilization of glutamic acid should block the synthesis by the animal itself. Such a partial interference with glutamic acid metabolism may produce symptoms in the central nervous system if glutamic acid plays an important role in its metabolism. An anti-metabolite of glutamic acid—the sulfoxide derived from methionine—has been found which effectively blocks the utilization of glutamic acid in the metabolism of Lactobacilli arabinosus and casei. This finding opens the possibility of studying the effects of partial blocking of the glutamic acid metabolism in mammals. It is of interest to consider how glutamic acid may effect the metaboonly amino acid capable of supporting respiration of brain tissue slices. This specificity is lost when chopped brain is used instead of brain lism of the brain. Weil-Malherbe has found that glutamic acid is the slices. The same author also found that glutamic acid suppresses anaerobic glycolysis in brain and raises aerobic glycolysis. Glutamic acid or its keto acid takes part in many reactions concerned with the metabolism of the end products of carbohydrate metabolism as in the citric acid cycle, in the fixation of carbon dioxide, and in transamination reactions. The enzyme system which synthesizes acetyl choline when inactivated by dialysis may be reactivated to a certain degree by the addition of L-glutamic acid. Glutamine likewise has many functions in metabolism, and these are summarized in some detail. 23 references.

27. Public Health, Epidemiology

Deaths by Age. United States, 1947. *National Office of Vital Statistics, U. S. P. H. S., Federal Security Agency, Washington, 25, D. C.* News Release, Jan. 30, 1949.

Analysis of the mortality statistics for the United States during 1947 indicates that the death rate is comparatively high among infants less than 1 years of age and is lowest among children 5 to 9 and 10 to 14 years of age. Above these ages the rate increases steadily with age. In each age group the death rate for females is lower than that for males. The accompanying table represents the data for the pediatric age period.

NUMBER OF DEATHS AND DEATH RATES BY AGE, RACE, AND SEX: UNITED STATES, 1947*

Age	All Races			White			Nonwhite		
	Both sexes	Males	Female	Both sexes	Males	Female	Both sexes	Males	Female
	Number of Deaths								
Under 1 year	119,173	68,622	50,551	98,547	57,180	41,367	20,626	11,442	9,184
1 year	7,357	3,963	3,394	5,817	3,149	2,668	1,540	814	726
2 years	4,326	2,454	1,872	3,498	2,011	1,487	828	443	385
3 years	3,275	1,863	1,412	2,707	1,557	1,150	568	306	262
4 years	2,651	1,490	1,161	2,196	1,250	946	455	240	215
5-9 years	8,463	5,030	3,433	7,028	4,242	2,786	1,435	788	647
10-14 years	7,272	4,466	2,806	5,762	3,634	2,128	1,510	832	678
15-19 years	13,997	8,558	5,439	10,739	6,872	3,867	3,258	1,686	1,572
	Death Rates								
Under 1 year	33.7	38.0	29.3	31.4	35.5	27.1	52.5	58.1	46.9
1-4 years	1.6	1.7	1.4	1.5	1.6	1.3	2.5	2.6	2.3
5-9 years	0.7	0.8	0.6	0.7	0.8	0.5	0.9	1.0	0.8
10-14 years	0.7	0.8	0.5	0.6	0.8	0.5	1.1	1.2	1.0
15-19 years	1.3	1.6	1.0	1.1	1.4	0.8	2.4	2.6	2.3

*Exclusive of stillbirths and deaths among armed forces overseas.

Infant Mortality and Its Causes in China. *Mary M. Y. Chen, National Institute of Health, Nanking, China.* Nat. M. J. China 34:53-61, February 1948.

A review was made of the reports from health centers in Chengtu, Langchow, Fukien and Pishan, a district in Szechwan, during the war and of those in Peiping before that. An analysis of 17,478 liveborn infants and 2,344 infants that died revealed an infant mortality rate of 134 per 1,000 live births compared with the previous average of 150 reported by other workers in China. Eighty per cent of deaths occurred in the first two weeks of life. The main causes of neonatal death were prematurity, birth injury, asphyxia, malformation, syphilis and tetanus neonatorum. Fifty per cent of the deaths were due to umbilical infection. Seventy per cent of deaths in older infants were due to infectious diseases: tetanus neonatorum, dysentery and diarrhea, pneumonia, measles, pertussis, meningitis, diphtheria, syphilis, erysipelas

and scarlet fever. As a result of two years maternal and child health work in Pishan, Szechwan, the infant mortality has been reduced 25 per cent. 11 references. 13 tables.—*C. L. Kao.*

Swimming Pools. Their Relation to Illness. *J. Roswell Gallagher, Phillips Academy, Andover, Mass.* New England J. Med. 238:899-903 June 24, 1948.

From 1941 to 1947 a comparison was made as to the incidence of respiratory infection among students who used the swimming pool and among those who did not. The number of hospital admissions for respiratory tract infections and the number of days of hospitalization were about 14 per cent greater in the swimmers. The number of hospital days spent for all causes was practically the same for both groups. The author feels that when careful controls are exercised there is no reason to expect a high incidence of respiratory infection among swimmers. In the presence of highly communicable diseases it is desirable to take extra precautions. 6 references. 6 tables.—*R. N. Paul.*

28. Respiratory System

Receding Chin and Glossoptosis. *Aron Nisenson, Los Angeles, Calif.* J. Pediat. 32:397-403, April 1948.

One of the causes of cyanotic attacks in newborn infants is receding chin, usually found in association with cleft palate and inspiratory retraction of the sternum. Ptosis of the tongue, which is usually associated with the hypoplasia of the mandible, causes mechanical obstruction of the larynx leading to difficulty in swallowing, respiratory embarrassment and malnutrition. Cyanosis and respiratory difficulty are most marked during feeding. A 7 week old infant is presented with cyanosis, respiratory difficulty and recurrent vomiting. Sternal retraction, cleft palate, receding chin and glossoptosis, best seen with the laryngoscope, were the outstanding features. The diagnosis at first was congenital laryngeal stridor. The child was helped by oxygen and by placement in the prone position with the chest elevated on a small pillow. The infant was encouraged to nurse reaching outward and upward. Subsequent treatment consisted of the construction of a headgear to the side of which two padded metal bars were attached. At the end of these bars were placed felt pads which pressed the mandible forward. Eighteen other cases are reviewed and tabulated. In reviewing the literature, it is apparent that the presence of receding chin, glossoptosis, cleft palate and sternal retraction constitute a clinical syndrome. 17 references. 1 table. 3 figures.—*Author's abstract.*

(*Receding chin may be due to a true micrognathia in which the mandible is underdeveloped in all dimensions or to retrodisplacement of a normally sized mandible. The prognosis for normal appearance is much better in the latter, of which the case described above seems*

to be an example. Although there may be various causes for this syndrome, it is perhaps most commonly due to acute flexion of the fetal head against the chest. Starting before union of the palatal buds takes place, the chin is displaced backward and this in turn forces the tongue upward into the nose, thereby preventing formation of the palate. When the deformity begins sufficiently early, there may be a cleft of the entire palate. In 4 such infants observed at birth by Dr. Charles C. Chapple (personal communication) pressure of the mandible on the chest had produced a forward bulging of the sternum with angulation at the base of the manubrium. One of these infants showed bilateral indentation of the thorax due to pressure by the rami of the mandible. In place of the headgear described above, the nursing bottle can be fitted with a padded metal bar extending forward to press against the infant's upper lip. The length of the bar is such that the infant is forced to project his chin forward in order to obtain a secure grasp on the nipple. It may be necessary to denude the under surface of the tongue and suture the tongue to the lower lip to relieve the oropharyngeal airway. Later, at 4 to 6 years, the tongue is released.—ED.)

Nontuberculous Pulmonary Calcification. *Alfred D. Biggs and Ralph G. Rigby, St. Luke's Hospital, Chicago, Ill.* J. Pediat. 32:393-36, April 1948.

In recent years a great deal of evidence has accumulated to indicate that tuberculosis is not the sole major cause of pulmonary calcification. Pulmonary infections with Coccidioides immitis and Histoplasma capsulatum are common in certain geographic areas. Contrary to a well established conception, these diseases occur frequently in mild form or even without any recognizable symptoms. The investigators believe that such infections are common causes of calcium deposits in the chest. Within a relatively short time 14 children were found with roentgen evidence of intrathoracic calcification and negative tuberculin tests (second strength P.P.D.). One year later these children were retested and were still negative to both P.P.D. and the Vollmer patch test. In order to rule out further the possibility of false negatives, all were bronchoscoped, the mucous membrane examined and the bronchial secretions studied by direct smear, culture and guinea pig inoculation. No evidence of tuberculosis was found in 13 cases. In the fourteenth, acid fast bacilli were found in the bronchial secretion. This case was a child with typical clinical and laboratory findings of Boeck's sarcoid. The group of children included both Negro and white, male and female, ranging in age from 3 to 14 years. Eight gave a history of frequent colds with cough, described usually as persistent or chronic. All were well nourished and appeared normal. When 12 of the 14 were tested intradermally with 0.1 cc. of diluted histoplasmin, 6 responded with a wheal 1 cm. or larger in diameter surrounded by a red zone. This reaction occurred within one hour (usually within fifteen minutes) and was interpreted as positive. The other 6 were negative at one hour

and twenty-four hours. The authors conclude that pulmonary calcification is not always due to tuberculosis. Infection with Histoplasma capsulatum may be one cause. Recurrent respiratory infections may be another. 9 references.—*Author's abstract.*

The Significance of Triangular Hilar Shadows in Roentgenograms of Infants and Children. *Rolfe M. Harvey and Ralph S. Bromer, Children's Hospital, Philadelphia, Pa.* Am. J. Roentgenol. 59:845-52, June 1948.

Triangular hilar shadows of increased density are discussed from the standpoint of their incidence, etiology and significance. In 300 consecutive roentgenographic examinations of the chest, 9 cases (3 per cent) were found showing this typical triangular shadow. All but 1 were rightsided. Seven of the 9 cases were less than a year old and none was over 2 years old. None was seriously ill, none required hospitalization and there was no history of previous serious respiratory illness. The tuberculin reactions were negative in 7 of the 9 cases. In all cases which have been followed for several years, no serious consequences have developed and the shadows have eventually disappeared. From their study the authors believe this shadow is most often due to persistence of the thymus and only rarely to other causes such as mediastinal pleurisy, pneumonia or atelectasis of the mesial border of the upper lobe, or to enlarged hilar nodes. 11 references. 6 figures.—*M. Maresh.*

(*In the discussion following this paper, Dr. Caffey added that he had recently seen a patient in whom a bronchogenic cyst was responsible for a triangular shadow projecting from the hilum. Dr. Neuhauser said he considered these shadows of no importance in 99 per cent of cases and that he objects to the use of such terms as hypertrophy of the thymus and persistent thymus in describing them. In his opinion, if the shadow is not significant in a particular patient, it should be recognized as a portion of the picture of the healthy chest so that the pediatrician, the family and the patient may be spared unnecessary worry and expense.*—ED.)

29. Skin, Teeth, Hair

The Local Treatment of Tinea Capitis Due To M. Audouini. The Importance of Inflammatory Reaction as an Index of Curability. *John P. Scully, Clarence S. Livingood, and Donald M. Pillsbury, University of Pennsylvania Medical School, Philadelphia, Pa.* J. Invest. Dermat. 10:111-18, March 1948.

This paper records observations on a group of 60 children with ringworm of the scalp due to M. audouini, all presenting an inflammatory reaction at the site of infection when first seen or some time later. All were observed for at least two months after apparent cure to make

certain that no relapse occurred. Such observation included clinical examination, Wood's light examination and cultural studies. These 60 patients with local inflammatory reactions were selected from a total series of 433 consecutive cases of tinea capitis caused by Microsporon audouini seen in an eighteen month period. In 106, or 24.4 per cent, the final infection was accompanied by some degree of inflammatory reaction. Thirty-five of the patients in this series had one or more siblings who also had ringworm of the scalp but an inflammatory reaction in one or more siblings was noted in only two families. Susceptibility to inflammatory reaction was not related to color or sex. The highest incidence of inflammatory reactions occurred in children between the ages of 4 and 6 years. Fifty-nine per cent of the inflammatory cases were below 6 years of age, whereas only 35 per cent of the non-inflammatory group were below this age. The inflammatory response ranged from mild low-grade folliculitis, usually with a few serous crusts to a severe pustular kerion-boggy with raised plaques exuding pus from multiple tiny sinuses. Inflamed lesions were frequently covered with a thick dried seropurulent exudate and loosened hairs. Of 60 patients 93.3 per cent were discharged as cured. No matter how widespread the initial process, if unmistakable inflammatory reaction set in, a favorable outcome was the rule. Absence of fluorescence was noted in less than one month after the onset of inflammation in 75 per cent of cases and in two to three months in the majority of the remainder. No patients were left with disfiguring alopecia as a sequel to severe kerion. Intracutaneous testing to 0.1 cc. of 1:30 Lederle's trichophytin (T. interdigitale) extract gave a percentage of positive reactions in cured cases of 91.6 per cent compared with only 35.1 per cent in those with non-inflamed lesions.

In view of these and other data collected by the authors, it is believed that the following general principles can serve as a useful guide in the management of tinea capitis: "1. The presence of an inflammatory reaction almost assures an eventual favorable outcome with local therapy alone, providing such reaction is not simply a transient reaction to the medication. . . 2. Most of the patients with ringworm of the scalp should have at least 2 months' trial of local therapy before resorting to x-ray epilation. At the present time, 10 per cent copper undecylenate ointment and 5 per cent salicylanilid ointment appear to be the most effective therapeutic agents. . . 3. An experienced observer can usually predict the probability of eventual cure with local therapy after 2 months' observation. The favorable criteria include presence of inflammatory reaction, loosening of the hairs, a change in the appearance of fluorescence from the characteristic bright, light green color to a dull, whitish-green color, and significant reduction of number of fluorescent hairs. . . 4. X-ray epilation should be reserved for the following patients with tinea capitis: (a) Those patients who have more than 50 per cent of the scalp involved with no evidence of inflammatory reaction, especially if the infection is not of recent origin, (b) those

patients who have not had any evidence of favorable response as outlined under (3) above after 2 months of local therapy, (c) those patients in whom complete cooperation of the patients cannot be obtained, and in whom there is no evidence of an inflammatory reaction. 5. Approximately 80 per cent of cooperative patients with tinea capitis due to M. audouini may be cured with local therapy by use of a combination salicylanilid-undecylenate ointment. 6. Prompt cure of the infection is important from the standpoint of preventing transmission of the disease to others." 6 references. 4 tables.

30. Social, Economic, and Organizational Problems

See Special Introductory Section

31. Surgery, Anesthesia

Antethoracal Transplantation of the Stomach in the Treatment of Congenital Atresia of the Thoracic Esophagus. *W. F. Rienhoff, Jr.* Bull. Johns Hopkins Hosp. 82:496-99, April 1948.

This report describes the procedure of antethoracal subcutaneous transplantation of the stomach in infants with extensive atresia of the esophagus. In 2 such patients 5 and 8 days old complete mobilization of the stomach and esophagogastrostomy at the level of the clavicle was accomplished at the first stage operation. This procedure was carried out rapidly and without shock to the patient. Immediate feeding was made possible by exteriorizing the esophagus through a separate incision below the clavicle. A small temporary salivary fistula developed at the point of anastomosis in each patient. Convalescence was otherwise uneventful. The patients succumbed to intercurrent infection at 10 and 12 months of age and autopsy revealed that the transplanted stomachs had functioned normally and remained viable.—*C. E. Koop.*

Acute Intussusception in Childhood. *Brenda Morrison and Donald Court, Royal Victoria Infirmary, Newcastle-upon-Tyne, England.* Brit. M.J. 4555:776-80, Apr. 24, 1948.

Only 39 out of 100 cases of acute intussusception showed the textbook picture in the vital first twenty-four hours of the disease. An analysis of the entire series revealed that more than one-third were in children under 6 months of age; a striking male predominance was not present; vomiting especially but also pain occurred early; spontaneous passage of blood was completely absent in 24 per cent; fever of 100 to 104 F. was frequent even in the first day of the disease. A history of sudden onset was common but was sometimes blurred by the occurrence of infection. Careful questioning of the mother was of

great importance. Complete constipation occurred in 8 cases. These were admitted the first day. Normal stools were passed in the first twenty-four hours by 36 patients. The abnormal stools which were eventually passed by most should rarely have been confused with an infective gastroenteritis. Early physical examination could reveal little. Localized tenderness and muscle-guarding were of importance when the tumor was not well-defined. The tumor was most difficult to palpate in the small bowel intussusceptions. Rectal examination gave valuable information. Barium enemata for diagnosis were not recommended. Administration of plasma or serum and an established infusion were recommended preoperative procedures. Anesthesia was not started until the surgeon was ready. Vomiting and distention during and after operation were minimized by a catheter in the stomach. Uncomplicated cases were discharged in three days. The mortality was 10 per cent. The outcome of the disease was felt to depend on its duration before treatment and good preoperative preparation. 8 references. 7 tables. 1 figure.—*L. N. Pearlman.*

(*The first sentence is of utmost significance.*—ED.)

Congenital Chondrosternal Depression (Funnel Chest) Relieved by Chondrosternoplasty. *Henry A. Brodkin, Newark, N. J.* Am. J. Surg. 75:716-20, May 1948.

An 11 year old girl is presented with congenital chondrosternal depression which was successfully corrected surgically by a chondrosternoplasty. This deformity is produced by a congenitally short central tendon of the diaphragm, and may be progressive. It predominates in males in the ratio of 4 to 1. It is described as an oval or funnel-shaped depression of the lower portion of the sternum and its adjacent cartilages. The evidence indicates that it begins with respiration at birth and results from a congenital developmental abnormality of the central anterior portion of the diaphragm. When the deformity of the anterior chest wall is marked there occurs displacement of the heart into the left hemithorax and compression of the lungs. Paradoxic respiration develops as a result of the inward pulling action of the shortened tendon on its attachment to the sternoxiphoid junction. The shape of the chest conforms to the abnormal action of the diaphragm. Operative reports indicate a short central tendon and a dense contracted substernal ligament. The clinical picture varies from no discomfort to symptoms of total invalidism. The vast majority suffer no ill effects from the deformity; many are never aware of the condition until it is brought to their attention at routine examination. A few subjects suffer symptoms of cardiorespiratory embarrassment because of the compression upon the heart and great vessels. Young children usually have no psychologic disturbances but in adolescents and young women the deformity is often emotionally disturbing to the point of warranting cosmetic plastic repair. Symptoms seldom appear in childhood before the age of 5. The most common complaints are fatigue, dyspnea on exertion, palpi-

tation and dull precordial pain. Physical examination reveals the thoracic deformity, tachycardia and varying degrees of cyanosis on effort. The vital capacity is usually diminished, sometimes as much as 50 per cent. On deep inspiration the lower anterior thorax retracts at the sternoxiphoid junction. Commonly a systolic murmur is heard over the mitral area so that many of these children are treated as cases of rheumatic heart disease. 12 references. 2 figures.

(*Most funnel chest deformities are of mild or moderate variety and do not require operation. When deformity is great and produces cardiorespiratory symptoms or distressing cosmetic appearance it is possible to alleviate the condition in young children by division of the retrosternal ligaments. This allows the sternum to grow more normally than in older subjects. When the thoracic cage is more ossified and stable, a more complicated procedure is required in which the depressed section is actually elevated or reshaped. Results of these operations are occasionally disappointing because of return of the deformity. It is important to stress the desirability of deferring operation, if possible, until the bony cage has become reasonably ossified and rigid because in the older age period there is a better chance of attaining satisfactory postoperative result.*—ED.)

32. Tumors

Familial Polyposis and Carcinoma of the Colon. *William L. Estes, Jr., Bethlehem, Pa.* Ann. Surg. 127:1035-45, May 1948.

Multiple diffuse polyposis of the colon is a disease with a familial tendency. It occurs in both males and females and may be transmitted by both. Carcinoma frequently or eventually develops usually at an by rectal examination, sigmoidoscopic examination and roentgen studies. All members of a family in whom diffuse polyposis of the colon is found, should be investigated thoroughly and repeatedly for evidence of the disease. The treatment of choice is total colectomy with or without resection of the rectum. If all the polyps of the rectum and rectosigmoid may be destroyed by fulguration, the rectum may be saved and total colectomy with ileosigmoidostomy will suffice. When the rectum and rectosigmoid are not excised, proctoscopic reexamination should be done at least every six months. Prompt fulguration of all new polyps is imperative if cancer in the remaining portion is to be prevented. A family is described in which the mother and all 6 adult children had had either multiple polyposis of the colon or carcinoma of the sigmoid or rectum, or both. 34 references. 5 figures.

(*Polyposis of the colon can make itself apparent even during early childhood. It may be diagnosed in childhood, the first symptom usually being bleeding by the rectum. Since these polyps are precancerous lesions, every child with multiple polyposis should have radical surgical attention while still in the pediatric age period. And siblings should be carefully examined, both by proctoscopic and by radiologic means.*—ED.)

Large Solitary Pancreatic Cyst and Other Developmental Errors in a Premature Infant. *Cornelia de Lange and Tieline A. E. Janssen, Emma Hospital for Sick Children, Amsterdam and St. John's Hospital, Zaandam, Netherlands.* Am. J. Dis. Child. 75:587-94, April 1948.

An infant weighing 2,000 Gm. at birth died at 8 days of age with a large abdominal mass. This was embedded in the gastrocolic ligament and contained 300 cc. of clear yellow fluid. Lipase and trypsin were present. Pancreatic tissue was found in the wall. The infant had other developmental anomalies. In the differential diagnosis a knowledge of the presence or absence of enzymes would be helpful. Gland-like structures are thought to be absent in other abdominal cysts. This condition was compared with several others described in the literature. 3 figures.—*W. E. Campbell.*

Two Cases of Cystic Lymphangioma of the Neck with Mediastinal Involvement. *Folke Jacobsson, Radiumhemmet, Stockholm, Sweden.* Acta radiol. 28:705-14, November 1947.

Cystic lymphangiomas are usually seen in children in the neck or groin. They are composed histologically of many cystic spaces filled with lymph. They do not metastasize but because of the location in the neck may give rise to severe symptoms, including compression of the trachea with dyspnea or dysphagia. Occasionally the lymphangioma extends into the thoracic cavity and with its lobulated structure extending deeply between the thoracic organs may present formidable difficulties to surgical removal. Several cases are on record in which irradiation treatment was successful, resulting in complete shrinkage of the tumor. Two such cases are reported here. In each the lymphangioma presented a visible swelling of the neck which was soft and gradually increased in size and when chest films were taken they showed the deep extension of the tumor into the thorax. The trachea and esophagus were displaced. One child had a hacking cough. Roentgen irradiation of the tumors was carried out in both cases. There was fairly rapid disappearance of the visible tumors in the neck, so that they were no longer visible three months after irradiation had begun. The intrathoracic shadow was much slower to subside but in both it had diminished in size and had regressed to less than one-fourth its original size when the patients were seen three years after treatment. 14 references. 4 figures.

(*Most lymphangiomas of the neck region are more refractory to irradiation than the 2 cases cited.*—ED.)

Childhood Cancer and Leukemia in the United States.

Stimulated by several inquiries which have come in, the QUARTERLY REVIEW OF PEDIATRICS *has compiled the accompanying tabulation of death from cancer and leukemia in childhood. The tabulation is based on data gathered by the National Office of Vital Statistics, U. S. Public Health Service, Federal Security Agency, from birth, death and still-*

birth reports submitted by the registration officers of States and cities. The original figures are published in the "Vital Statistics of the United States, 1945, and Special Report Vol. 27, No. 26, 1947". The data for 1946 have not yet been announced.

TABLE I.—DEATHS AMONG CHILDREN IN THE UNITED STATES FROM CANCER, LEUKEMIA AND OTHER TUMORS, 1945

Location	Under 1 Year	1 yr.	2 yr.	3 yr.	4 yr.	Under 5 Years	5 thru 9 yrs.	10 thru 14 yrs.	Totals for ages 0 thru 14 years
Buccal cavity and pharynx	3	—	3	3	3	12	7	14	33
Stomach	1	—	—	—	2	3	—	2	5
Rectum and anus	1	—	—	—	—	1	1	1	3
Intestines, etc.	3	2	2	3	4	14	13	15	42
Liver and bile passages	6	5	1	4	1	17	9	3	29
Pancreas	2	—	—	—	1	3	1	1	5
Mesentery and peritoneum	2	4	4	9	3	22	13	2	37
Respiratory system	5	2	6	4	1	18	7	29	54
Uterus	—	—	1	1	1	3	2	—	5
Other female genital organs	—	1	2	3	1	8	6	11	25
Breast	—	—	1	—	1	2	1	—	3
Male genital organs	1	2	6	1	—	10	3	5	18
Kidney	15	30	35	48	29	157	59	7	223
Bladder	1	1	—	1	—	3	—	2	5
Skin	4	4	—	2	2	12	6	6	24
Central nervous system and eye	10	32	51	42	31	166	111	79	356
Unspecified	—	29	27	22	16	94	67	63	224
Miscellaneous	34	4	15	26	7	175	22	92	375
Total deaths from malignant tumors	88	116	154	169	103	630	338	332	1,290
Nonmalignant tumors	—	7	13	8	8	36	29	28	93
Leukemia	114	110	149	136	122	231	289	171	1,091
Aleukemic disorders	2	4	4	4	10	24	16	9	49
Total childhood deaths from all cancer, nonmalignant tumors, the aleukemias, and leukemia	204	266	347	339	259	1,415	739	593	2,747

A number of generalizations of interest are apparent. To begin with, it is possible that the true figures are higher than given here. Not every childhood death from malignancy and leukemia in the United States finds its way into the official statistics. Many such children may not be referred to physicians until the terminal illness, when the true nature of the disease, or at least its site of origin, goes unidentified. Other children despite good medical supervision may not be recognized as having a malignant disease and will be recorded under other causes of death. Nevertheless, this over-all survey should be more truly representative of the distribution of affected organs than are the smaller series gathered from single hospitals and diagnostic registries. Many patients come to these latter institutions for random reasons, such as being difficult diagnostic problems or suffering from involvement of some organ system such as brain or lung for whose care a particular hospital is specially staffed and equipped.

One notes from the tabulation that the organ systems most often affected by malignancy in childhood are the kidney, the central

nervous system and the blood (leukemia). These malignancies are most common in the age group under 5 years, less common between 5 and 9 years, and least of all between 10 and 14 years. The other varieties of malignancy (except for the few aleukemic lesions whose incidence also seems to diminish with increasing years) exhibit no significant correlation with age. The significance of age is further borne out by the death rate figures taken from Special Report vol. 27, no. 26 of the Vital Statistics Office, dated Feb. 16, 1947, which show the following age-period differences in rate among children dying in 1945 from cancer and other malignant tumors (not including leukemia and the aleukemic disorders): Under 1 year, 3.5 per 100,000; 1 through 4 years, 5.1 per 100,000; 5 through 14 years 3.0 per 100,000.

It would be much more informative to have the Vital Statistics data in terms of histopathologic entities rather than of organ systems. It is always more desirable, clinically, to identify tumors in patients according to histopathologic categories as Wilm's tumor, neuroblastoma, astrocytoma, etc. The latter approach would furnish more information with respect to prognosis, choice of treatment and location of possible metastatic lesions.

THE PEDIATRIC BOOKSHELF

Pediatria Internazionale. Edited by Gino Frontali, Director of the Pediatric Clinic of the University of Rome. Published by Instituto Bibliografico Italiano, Via dei Giardini, 42 B, Rome, Italy.

The first number of this new quarterly journal, volume I, number 1, January-March 1948, has just come in. There are twelve original articles, all devoted to an analysis of the diseases and problems of public health in Rome during the recent war. The studies were sponsored by the National Research Council, and abstracts of some of these will be found in the respective sections of this issue of the QUARTERLY REVIEW OF PEDIATRICS. Each report carries at the end a brief summary in four languages—Italian, English, French and German. Best wishes to the Editors of Pediatria Internazionale. May the succeeding issues keep up the high standards of this first number!

Congenital Malformations of the Heart. *Helen B. Taussig, Associate Professor of Pediatrics, Johns Hopkins University School of Medicine and Director of the Children's Cardiac Clinic at the Harriet Lane Home of the Johns Hopkins Hospital, Baltimore, Md.* New York, The Commonwealth Fund, 1947. 618 pp. $10.00.

The surgical repair of congenital heart malformations owes much of its flowering during the past decade to the painstaking pioneer analyses of patients conducted by Helen B. Taussig at the Johns Hopkins Hospital. This monograph—what a splendid one it is!—is a résumé of her experiences and studies, organized as a clinical reference book. Each anomaly is carefully discussed with respect to anatomy and course of the circulation, and then the clinical, electrocardiographic and radiologic aspects are presented and correlated. Diagnosis, differential diagnosis treatment and prognosis are taken up in turn and illustrative case histories given. Indications and contraindications for surgery are examined in the light of the author's own extensive studies. Intracardiac catheterization, roentgen visualization of the heart by injections of radiopaque substances and physiologic gas analyses receive little attention because the methods are still difficult and require trained teams of specially trained workers. The illustrative material represents modern medical art at its finest and must also be praised. The text on each major anomaly is accompanied by one or several original pictures of a typical gross specimen, frequently with an accompany-

ing red and blue diagram of the distorted circulation, shaded to conform with the extent of oxygenation of the different segments. Roentgenograms and electrocardiograms are reproduced in abundance, the former often being accompanied by explanatory line diagrams. The book is aimed at the student and practitioner rather than the skilled physiologist. It belongs in the library of every physician whose practice includes patients with congenital heart disease.

Premature Infants. A Manual For Physicians. *Ethel C. Dunham.* Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 401 pp. illus. $1.25.

In the United States approximately 150,000 births occur prematurely each year. Any condition with this high incidence is a public health problem of the first magnitude, to say nothing of being (as we all know) a great challenge on the one-by-one level of the handling of individual cases. Dr. Dunham has been internationally known for years as a prime student of the premature and its problems, and this monograph on the subject, just published, may be viewed as the fulfillment of a lifetime's assembling of the facts coupled with reflection over their significance. The pages are crammed with information regarding every aspect of the live-born premature—objective measurements, causes, prognosis, prevention, clinical appraisal, nutritional needs, feeding requirements and discussions of the manifold disorders and diseases from which prematures can suffer. About all that is missing is the wording for an autopsy permission slip and instructions on how to perform the dissections in the absence of a pathologist. The text itself is divided into two main sections: General and Clinical Considerations. There is also a complete index, some exceedingly well-chosen illustrations and 9 appendixes dealing with such matters as standard birth certificates, stages and sequences of development, specifications for incubators, model medical and nursing records and so on. A distinctive feature is the open acknowledgement on the part of the writer to the many other workers whose studies form the supports and bricks out of which her synthesis has been constructed. Credit is given wherever due, with a carefully annotated bibliography to guide the reader who wishes to pursue any point in greater detail. Dr. Dunham's contributions consist firstly in assembling and arranging her own studies and those of others in orderly and readable sequence and secondly in the integrity of judgment which permeates every page. Equal space is given to opposing viewpoints where knowledge is still uncertain. The important aspects of management and therapy are stressed in extensive discussions, while minor matters receive a more rationed attention.

The Child in Health and Disease. *Clifford G. Grulee and R. Cannon Eley.* The William and Wilkins Co., Baltimore, 1948. 1007 pp. illus. $12.00.

Textbooks of pediatrics of a "complete" nature are few, and so

the appearance of the first edition of a new text calls for some special mention. This one is the product of the collaboration of some sixty-five contributors, all experts in their respective fields. The ninety-one chapters are grouped into nineteen sections, devoted to the broad fields of nutrition, the newborn, communicable diseases, acute infections, chronic infections, organ systems of the body, adolescence and surgical conditions. There are also chapters on the teeth, eyes, skin, blood and lymph, accidental poisoning and first aid. The few illustrations are good. The informational burden of contemporary pediatrics is brought out by the observation that the contained factual material—which represents the indispensable minimum of knowledge for proper practice of the specialty—requires more than one thousand large pages of two-columned 7 point small type. And none of the disorders receives a really detailed presentation. The individual topics are well and adequately handled, generally speaking, though some sections are better than others. The chapters on adolescence, allergy, nutrition, nervous diseases and skeletomuscular disorders may be singled out as extremely well done, whereas malignant tumors are discussed inadequately. Pardonable exception may be taken to a few statements or omissions here and there, particularly in the fast moving realms of antibiotics and antihistaminics. Certain sections on infectious diseases leave much to be desired. Medical editors and publishers cannot always include the most recent advances and changes in diagnosis and therapy which come along during the long intervals required for typesetting, proofreading, printing, binding and distributing. One would agree with the claim on the jacket that "emphasis is on practical considerations of problems met in everyday practice." This new Grulee-Eley can be recommended to students as a reliable readable textbook, to pediatricians-in-training as a well-balanced condensation of essential knowledge, and to the busy practitioner as an authoritative and convenient desk-reference.

Psychopathology and Education of the Brain-Injured Child. *Alfred A. Strauss, President, Cove Schools for Brain-Injured Children and Laura E. Lehtinen, Educational Director, Cove Schools for Brain-Injured Children, Racine, Wis.* Grune and Stratton, New York, 1947. $5.00.

The examination, testing and education of abnormal children is a difficult and time-consuming occupation. The authors of this book have obviously done a great deal of work with such children and here record many of their observations and conclusions. The book is divided into two parts. The first part discusses the psychopathology with chapters on perceptual disturbances, thinking disorders, behavior disorders, and methods of testing the so-called brain-injured child. Details of methods of estimating perceptual disturbances, thinking disturbances, etc. are outlined and should be of much value to others working in this particular field. The second part discusses general principles in teaching these children, as well as carefully worked out methods for teaching the

fundamentals of arithmetic, reading and writing. In their introduction the authors state that "this book deals with those children, physically handicapped or physically sound, who show intellectual and personality aberrations as a result of injury to the brain substance." They obviously include children with cerebral palsy. Neurologic studies tend to show that this disorder is not necessarily the result of trauma during the act of birth but may well be the result of some unknown influence in development. This argument may be academic since such children have abnormal brain structures as has been repeatedly demonstrated. Children who have abnormality as a result of epidemic encephalitis or other inflammatory processes in the brain tissue, are excluded from the syndrome of brain injury as used in this book for reasons not altogether clear to the reviewer. The book is well bound, not voluminous, contains clear, helpful illustrations and will be frequently consulted by those working with handicapped children.

The Psycho-Analytical Approach to Juvenile Delinquency. Theory, Case-Studies, Treatment. *Kate Friedlander.* International Universities Press, Inc. New York. $5.50.

Juvenile delinquency, which the author thinks "is a disease of society just as cancer, for instance, is a disease of the individual," certainly is one of the most burning questions confronting society. This book surveys comprehensively the contributions freudian psychoanalysis made and can make to the cure of this form of maladjustment and links them up with the attempts from other angles. By illuminating the intricacies of the problems involved, it points out the need and the place for close cooperation between the various methods and specialists now engaged in this work.

Handbook of Pediatric Medical Emergencies. *Department of Pediatrics, New York Post-Graduate Medical School and Hospital, New York, N. Y. Adolph De Sanctis, Chairman.* 1948. 89 pp. $2.00.

Most emergency therapy in large centers is administered by hospital residents and interns. Even the most experienced clinician finds it very difficult to keep in mind all the detailed knowledge required for handling the many and varied problems which may arise. This small handbook is designed to make such facts readily available. The material is presented clearly and concisely in a form which can be readily useful. Using it, the intelligent resident physician can carry his patient over the first clinical hours until his seniors can be consulted. Not infrequently the consulting staff man will also profit by what the resident has learned. Poisoning, croup, convulsions, coma, head injuries, dehydration, acidosis, cardiac emergencies, heat stroke, snake bites and various types of trauma are included. A few minor criticisms might be suggested: For ingested poisons, one might hesitate to use apomorphine for small patients and would place gastric lavage first rather than third. Pilocarpine is of doubtful value in treatment of atropine

poisoning and is itself dangerous. True desensitization of the patient truly allergic to horse serum is impossible; this section should be more specific. The recommended dosage of rectal ether for status asthmaticus, 60 to 120 cc. (2 to 4 ounces), is rather high. Sixty to 75 cc. is usually ample for an adult. This handbook can be recommended as a practical and useful presentation of sound methods for emergency treatment. A typical excerpt, on the treatment of diabetic coma, is reproduced in slightly altered form on page 155, this issue of the QUARTERLY REVIEW OF PEDIATRICS.

(*This booklet is available and may be obtained from Miss V. States, Secretary of the Department of Pediatrics, New York Post-Graduate Medical School and Hospital, 303 East 20th Street, New York 3, N. Y. The price is* $2.00—ED.)

Studies in Child Development. *Arnold Gesell, Director of the Clinic of Child Development, Yale University, New Haven, Conn.* Harper and Brothers, New York, 224 pp. 1948. $4.00.

This is a miscellany of papers delivered on various occasions by one of the most skillful and popular medical writers of our day. All the papers "deal with a single unifying theme, namely, the characteristics and conditions of child development". Methods of scientific approach, the patterns of growth, and their clinical and social applications—with special reference to the developmental diagnosis of defects and deviations and supervision of normal child development —are all considered.

An Introduction to Bacteriological Chemistry. 2nd ed. *C. G. Anderson, University of Edinburgh.* Williams and Wilkins, Baltimore, 1946. $5.00.

The physician interested in becoming familiar with the cellular chemistry and metabolic activities of bacteria as a form of life will find this an excellent compendium of source material.

The ABC of Acid-Base Chemistry. *Horace W. Davenport, Professor of Physiology, University of Utah School of Medicine.* Published by the Author, Salt Lake City, 1947. $1.50.

"The purpose of this book is to provide medical students with a comprehensive and intelligible outline of the elements of acid-base chemistry." After perusal of the text one would agree that the system of presentation here employed makes a complicated subject easy to understand. The pages are lithoprinted, with numerous diagrams and examples for use in self study.

Chemistry, Anatomy, Physiology and Pathology of Extracellular Fluid. A Lecture Syllabus. *James L. Gamble, Department of Pediatrics, Harvard Medical School, Cambridge, Mass.* Harvard University Press, Boston, 1947. $1.00.

This is an extensive and excellent summary of the electrolytic relationships in blood and tissue fluids. Fifty-odd charts and graphs make for easier understanding of the complex acid-base equilibria —which alert clinicians should comprehend for the best management of alkalosis, acidosis and dehydration.

Practical Methods in Biochemistry. *Frederick C. Koch, Frank P. Hixon Distinguished Service Professor Emeritus of Biochemistry, University of Chicago and Martin E. Hanke, Associate Professor of Biochemistry, University of Chicago, Chicago, Ill.* The Williams and Wilkins Co. Baltimore, Md., 1948. 419 pp. illus. $3.00.

For years the Koch-Hanke manual has been recognized as an authoritative manual for biochemical methods. Primarily intended as a guide for medical students, it has also proved of great service in hospital and similar chemical laboratories. The main changes in this latest edition are expansion of the material on manometric methods, the introduction of new or revised fluorometric and colorimetric methods and the addition of microbiologic technics for measurements of vitamins and amino acids.

The Foot and Ankle. Their Injuries, Diseases, Deformities and Disabilities. *Philip Lewin, Professor of Bone and Joint Surgery, Northwestern University Medical School.* Lea and Febiger, Philadelphia, 1947. 847 pp. illus. $11.

This third edition contains the latest recognized facts and reflects the modern concepts of etiology, diagnosis and treatment. It is almost encyclopedic in scope. Discussions are included of some of the common foot and ankle defects which come to the pediatrician's notice.

Modern Medicine Annual—1948. *Modern Medicine, Minneapolis 2, Minn.* $5.00.

A systematized collection of the miscellaneous abstracts and reports published in *Modern Medicine* in 1947, including a symposium on cancer.

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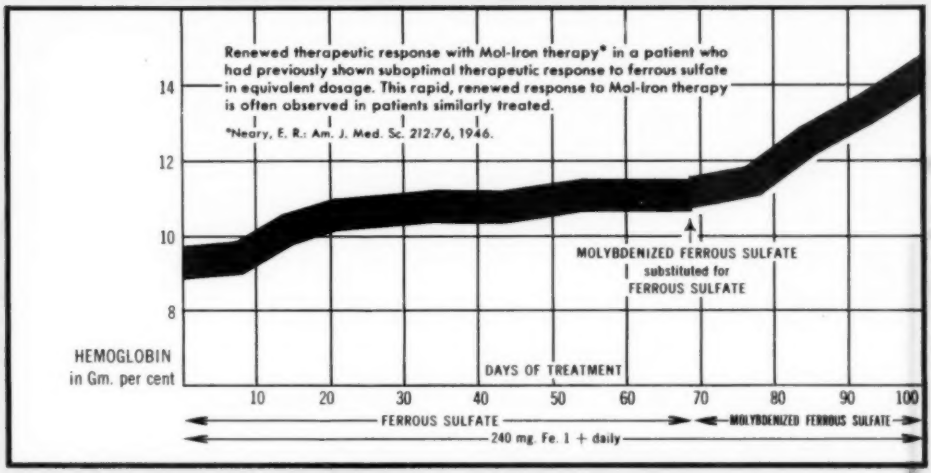
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1. Healy, J. C.: Hypochromic Anemia: Treatment with Molybdenum-Iron Complex, Journal-Lancet 66:218 (July) 1946.
2. Kelly, H. T.: Gastro-Intestinal Intolerance to Orally Administered Iron, Penn. Med. J. 51:999 (June) 1948.

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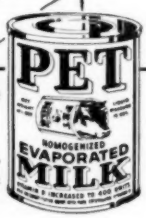

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